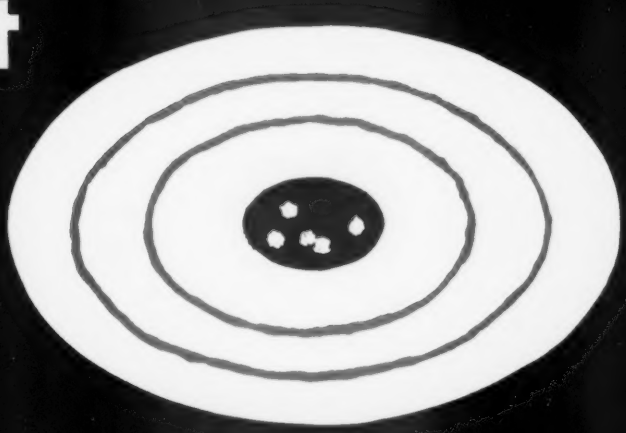
ARMY

MARCH 1959 • 60¢

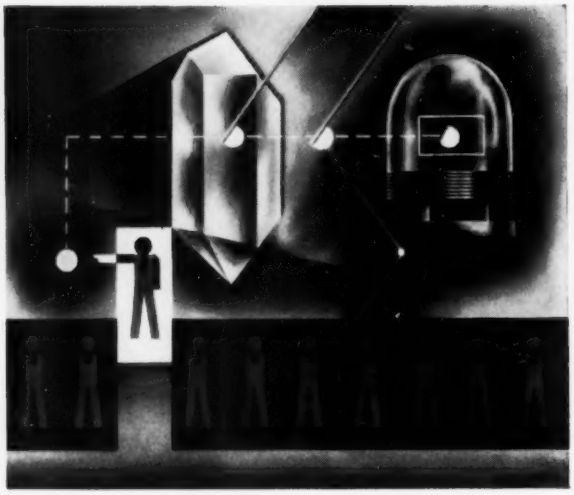
keeping the deterrent ON TARGET



Also: Two important articles on the Army's industry-arsenal team and lead time ▶ A sensible plea for more readable manuals ▶ The tactical mobility promised by improved air and ground vehicles ▶ An exploration of the pros and cons of vehicle pooling in the Pentomic infantry division

OFFICIAL AUSA ELECTION BALLOT IS ON PAGE 79

MISSILE COMPONENTS Bulova's infra-red seeker cells are designed to lock any missile on target; Bulova's fuzing systems do the rest. Powder-driven gyros, timers, safety-and-arming systems and other electronic and electro-mechanical devices, designed and made by Bulova, play vital roles in the Sidewinder, Dart, Talos... in all, 18 key missiles.



AUTOMATION Bulova R&D designed mechanized plant and equipment for Signal Corps goal of 10,000 perfect quartz crystals per 8 hour shift —with 1/10th the manpower. From systems analysis through equipment development, Bulova engineers devise industrial and military facilities for automatic production of electronic components and ordnance items.

Bulova precision helps to solve today's most challenging problems

Time, mass, length... the age-old concepts man relies on as he enters the Age of Space.

Time alone is unique. Its accurate measurement demands the highest order of precision in the design and manufacture of electro-mechanical devices.

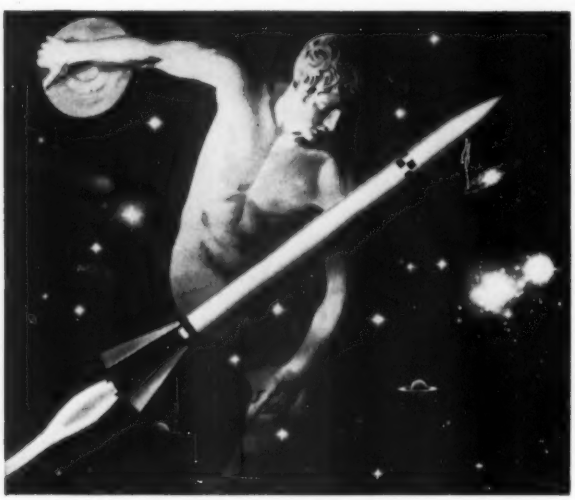
Bulova, leader in measurement of time, has become master of the very combination of abilities that holds practical solutions to the growing challenges of miniaturization.

Miniaturized systems and components by Bulova are now working for our nation's defense and automated industry. The same vision and experience that developed them are available to assist you... from concept to reliable mass production.

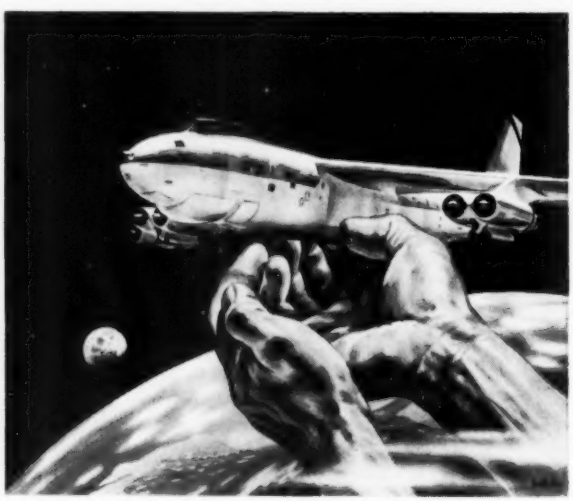
For full information, write *Dept. G.I.S.-1, Bulova Park, Jackson Heights, New York.*

BULOVA
watch company

BULOVA RESEARCH AND DEVELOPMENT LABORATORIES, INC.



PRECISION MANUFACTURING Bulova-built servo muscles steer our nation's first ballistic guided missile — the Corporal. When critical tolerances demanded uncompromising accuracy, Bulova solved tooling and assembly problems on a crash basis. Bulova experience and facilities are unexcelled where precision, reliability and capacity are vital.



AIRCRAFT INSTRUMENTS Bulova's new Servo Altimeter combines unsurpassed sensitivity and accuracy with direct-reading tape presentation. Special pressure devices created by Bulova include transducers for air data computers... remote pressure sensors for weather stations and airports... climb and dive indicators... and autopilot altitude controls.

...NEWS IS HAPPENING AT NORTHROP

FIRST LOW-COST SPACE AGE AIRCRAFT DEMONSTRATES NORAIR SYSTEMS MANAGEMENT CAPABILITY

The twin-jet T-38 –America's first supersonic trainer–aptly demonstrates Norair's capability in systems management. Now in production under USAF contract, the T-38 Talon is the first member of a Northrop-conceived family of lightweight, low-cost space age aircraft.

Soon to follow: a supersonic counterair fighter, the N-156F – first weapon system designed in America for the specific tactical and economic requirements of those free allied nations most vulnerable to enemy attack.

Other important systems management achievements include the USAF Snark SM-62A and the F-89 Scorpion. Norair management of the Snark program produced the free world's first operational intercontinental guided missile – delivered on time and at minimum cost.

In producing America's first nuclear-armed interceptor, Norair's weapon system management of the F-89 was marked by on-time delivery of more than 1,000 units throughout the program's life, and by a significant dollar underrun. A full ten years after its first flight, the Scorpion is still the USAF's most heavily armed interceptor – and a uniquely stable platform for air-launch of atomic rockets.

Norair's cost-proved record of effective management, integrated facilities, and available resources combine to demonstrate outstanding capability as a prime systems contractor.

NORAIR *formerly Northrop Division*
HAWTHORNE, CALIFORNIA
A DIVISION OF NORTHROP CORPORATION

Lockheed's Hercules takes U.S. based troops

Any place on Earth in 1½ days

The Jet Age's first strategic/tactical transport, the new Lockheed C-130B HERCULES, is the only U. S. Air Force plane designed specifically to airlift battle-ready troops, equipment, and supplies from the U. S. to any area on earth in 36 hours or less—then para-drop them into battle zones or land with them on short, rough fields, sand, snow or ice.

The C-130B HERCULES is a huskier, more powerful, longer range version of the C-130A HERCULES—which in two years of world-wide service with the Air Force has become the unchallenged Champion of the U. S. Strategic Airlift.

Now coming off production lines at Lockheed's Georgia Division, the new C-130B HERCULES will soon enter service with the U. S. Air Force's Tactical Air Command.

Takeoffs from deep sand averaged only 1500 feet in a C130A at 110,000 pounds gross weight. With same load it landed on sand and stopped in less than 950 feet.

Landing on frozen lake, "Ski-130" (weighing 62 tons gross) stops in 1200 feet. Taking off from same lake, this ski-fitted Airlift Champion was airborne in 2100 feet.

20 tons of pallet-loaded cargo can be winched in or out of the C-130 in 40 seconds. HERCULES can land, unload 20 tons, reload 20 tons, take off in 20 minutes—saving 2½ hours.

The C-130 HERCULES transports 92 battle-ready troops, or 64 fully-equipped paratroops – and holds the world record for the heaviest parachute-extracted drop: 30,370 pounds.

C-130B Hercules Specifications: Wingspan, 132.6 ft. Length, 97.7 ft. Cargo volume, 4300 cubic ft. Gross weight, 135,000 lbs. Engines, 4 GM-Allison 4050 eshp Prop-jets.

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NUCLEAR REACTOR DESIGN & DEVELOPMENT • GROUND SUPPORT EQUIPMENT • WORLD-WIDE AIRCRAFT MAINTENANCE

THE MONTH'S MAIL

Rise and Shine

● Major General H. P. Storke hit the nail square on the head in "Image of the Army" in the January issue.

If the grass roots would rise up and tell the Army's story—and tell it straight—there would be fewer RIFs.

MAJ. THOMAS W. GREEN
Kansas City, Mo.

Jeep is Trademarked

● On page 62 of the January issue of ARMY there is a photo and caption pertaining to an "aerial jeep," an aeronautical vehicle being developed by the Army and Piasecki Aircraft Corporation.

I feel your readers should know that "Jeep" is the registered Willys trademark. It has been registered not only in the United States but in some 90 foreign countries as well.

We know it is virtually impossible, and at the least, impractical, to try to prevent the man in the street from referring to any vehicle that resembles ours as a "Jeep" vehicle. However, it is our responsibility to call to the attention of all publications the fact about our trademark. The trademark is the property of Willys and may not, legally, be used by any other manufacturer or sales outlet.

I call this to your attention because I feel you have not been aware of our trademark rights and so that you may call it to the attention of your staff.

MARDEN R. BISHOP
Willys Motors, Inc.
Toledo 1, Ohio

OCMH

● Mary Tanham's story on the Office of the Chief of Military History was very interesting, and I enjoyed it very much. I would like to get in touch with Mr. Detmar Finke, who is mentioned as the German Army expert at OCMH. I imagine OCMH is in Washington, but the story didn't say. Please let me know.

I have already ordered two of the books listed at the end of the story, both on the German campaigns in Russia.

SGT. MILTON CROWE
Fort Stewart, Ga.

● *Like any other DA agency, the Office of the Chief of Military History can be reached at: Department of the Army, Washington 25, D. C.*

Appreciation of Chaplains

● Permit me to congratulate Captain Ben Harrison on "The Characters Guide Themselves" in the January issue of ARMY. He deserves not only our thanks, but our appreciation as well.

Since the publication of the new AR 600-30 on character guidance, the Chief of Chaplains has been given additional responsibility besides the preparation of the instructional material. He is to develop, under the Deputy Chief of Staff for Personnel, Army-wide policy, conduct research, develop responsibility areas for other staff agencies, and review and analyze the entire program.

Our first step is to encourage chaplains to hold a special officer and senior noncommissioned officer orientation. We plan to put into the hands of all chaplains a specially prepared orientation on the topic of the month to facilitate this purpose. Our second step, already promulgated in the AR, is to encourage the establishment of character guidance councils at battery and company level, thereby necessarily involving platoon, squad, and section leaders.

The weight of Captain Harrison's article is especially gratifying because it comes from a line officer in the field. We are happy to have been permitted by AUSA to reproduce it and disseminate it to all chaplains.

MAJ. GEN. FRANK A. TOBEY
Chief of Chaplains
Washington, D. C.

Broken Backbone

● I enjoyed Captain Weaver's Cerebration on standardizing noncommissioned officer training [January]. This training certainly needs a revamping, and Captain Weaver rates a pat on the back by all noncommissioned officers.

I would like to add a few comments of my own. I have attended a noncommissioned officer academy. In the unit in which I am serving there are others who have attended. We who have graduated are now told we must attend again. I am not one to complain, but isn't this carrying the thing just a little too far?

In my outfit we have noncommissioned officers who couldn't teach a class if they tried. They need the MOI that is taught during the first three weeks. Do we ever think of these soldiers who spend more dollars than the authorized clothing allowance, bucking for a chance to attend NCO academy? Why not give them a chance instead of sending those deadbeats who get to go a second time because they know the right people? These men should be replaced by some of the specialists who were wronged by the reconversion.

Captain Weaver also thinks that when a soldier graduates an entry should be made on his Form 20. It used to be made on mine. Why isn't that being done now? The school I attended was an established one where we spent eight weeks of hard training and study. I volunteered, as did the others.

I agree that all academies should follow the same pattern of training up to a certain point. That is, up to the last two weeks, which I think should be on subjects related to the post's mission. For example, Fort Leonard Wood has basic engineer training. Therefore, that post could use this phase to round out the noncommissioned officer's training in infantry, engineer, armor, or weapons.

Captain Weaver also believes those noncommissioned officers who become eli-

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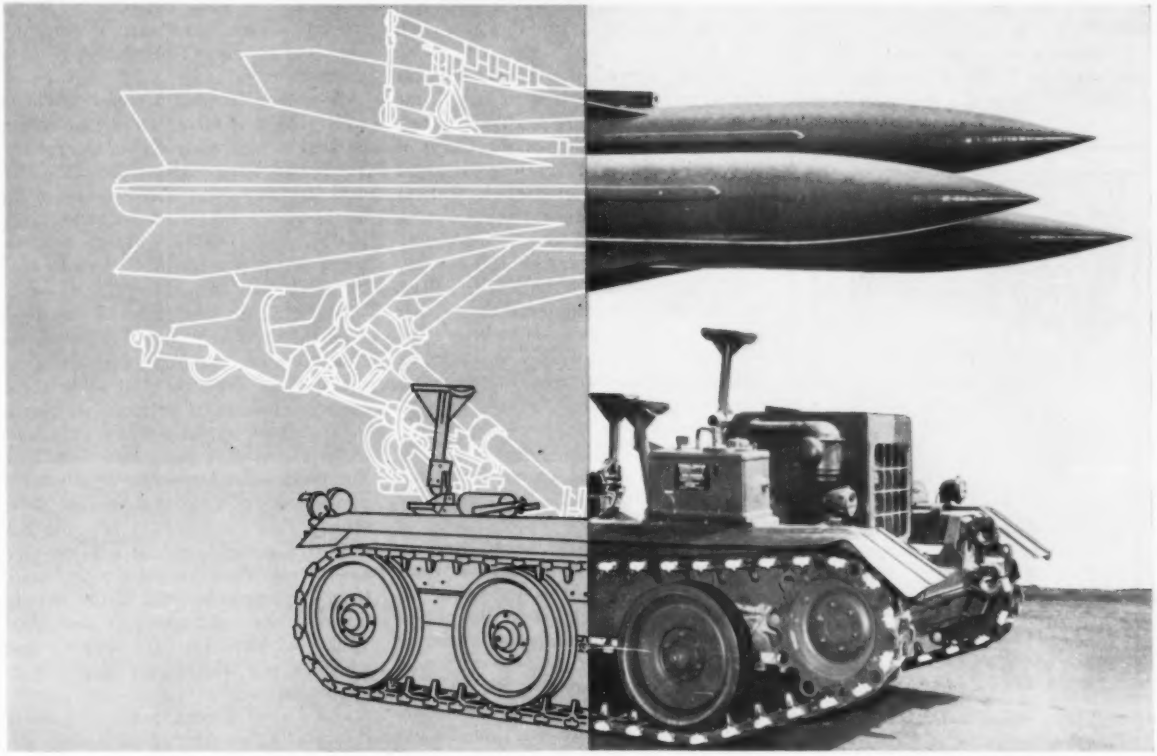
...speaking of

Missile Ground Support ***MOBILITY***



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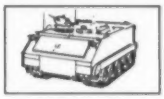
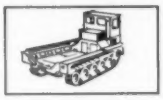
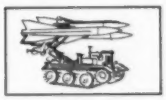


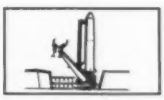
Multi-Purpose Vehicles



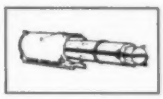
Prime Movers



Transporter-Loaders



Launcher-Erectors & Power Units



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gible for promotion should be sent to an advanced academy for three weeks. There they would familiarize themselves with positions in higher command and staff. That's fine, but what about those of us now in the field who lack such training?

I was assigned to my present unit in September 1957 after returning from overseas. I went to the Engineer Equipment Platoon, part of the battalion's headquarters and headquarters company. The job of the platoon leader (an officer) is to look to his men's welfare, maintain equipment, and keep records. Unless you examine his duties closely, you think that isn't too much of a job. But I can tell you it is.

We are authorized a platoon sergeant whose primary job also is to look to the men's welfare. He is responsible for their training in the mission of the Corps of Engineers. The platoon sergeant must supervise the men on the job without the help of the platoon leader. But he can't supervise them, because his administrative load is so heavy he can't possibly fulfill his mission. It naturally follows that he gets rusty in some things that pertain to field operations. So he is rated as incompetent and subject to reduction. Headquarters doesn't raise a finger to require the platoon *leader* to take the load from the platoon sergeant's shoulders.

Everyone knows the old saying about the noncommissioned officer being the backbone of the Army. The Army, like the other services, has broken the backs of both officers and noncommissioned officers with loads and more loads of paperwork. That other old saying about an army moving and fighting on its stomach should be changed to say *our* Army moves and fights on paper.

Though still a sergeant, for the past 17 months I have been platoon *leader*. I will confess that my work could have been made so much easier had I been given an advanced course in higher command and staff. But at another noncommissioned officer academy? Not for me.

Keep up the good work for us in ARMY. I will be interested to see what comes out of Captain Weaver's recommendations.

Name and address
witheld by request

Basic Training and Trainers

• I disagree with Major Kent's proposal [The Month's Mail, February] to segregate recruits according to mental ability during basic training.

We've all seen many highly intelligent recruits who don't demonstrate a jot of horse sense in the field; who haven't the slightest conception of how to get through a barbed-wire fence, or how to hit the ground or take advantage of cover and concealment. It does not necessarily follow that a high level of intelligence makes men more skillful in performing the *basic elements* of soldiering.

Possibly Major Kent has found that a broad-grinning farm boy with no more than fifth-grade schooling sometimes demonstrates considerably more skill with a rifle after 96 hours than does a lad of higher breeding who bolos.

Basic training, in the strictest sense, involves more physical coordination and know-how, as pointed out by Colonel Swift ["Basic Training Isn't Simple," November 1958] than book learning. The more intelligent recruit might *express* his knowledge of basic subjects to the inspecting officer better than Elmer Fuddled, but he doesn't necessarily *perform* them better.

A well-coordinated physical specimen with a high level of intelligence might be used to help some of the others along. You'll find these leader types doing this now. By doing this a few hours might be saved, or training effectiveness improved, but I seriously doubt that we are going to cut training time in half by using such an approach.

Major Kent's segregation of the hives from the goats will pay off *after* the recruit has first been trained in the combat skills of the individual soldier. For example, Johnnny Smart can be taught to read and apply artillery ephemeris tables much faster than Elmer Fuddled. But our classification system usually keeps Fuddled out of units that demand these skills.

If it is desirable to cut training time and to get fillers into the units faster, then let's determine how we can streamline our system of training the individual soldier: where we can cut extraneous time which is not immediately necessary to a replacement.

CAPT. HARLAN G. KOCH
Fort Sam Houston, Tex.

• After reading Colonel Swift's article on basic training [November 1958], I feel I should add my say.

I spent two long years in a training unit. When the time came to reenlist I used my option and got out of my training job. Not so much for the schooling I reenlisted for (it will delay my promotion two years), but because of the way we had to work. It takes a special type of man, a dedicated man, to teach basic training.

Three types of pressures are imposed on the officers and men concerned with basic training: by the trainees themselves, by parents and their influence, and by the military know-it-all.

I can recall many incidents that will show why the cadres in many training units are reenlisting for other units or for schools, volunteering for airborne or overseas duty, or even applying for duty as subjects at testing centers.

I had one trainee stand up in class and tell me he had a college degree, and there was not a thing I could teach him that he didn't already know. Had I touched that man the way I wanted to right then, I would have landed in the stockade. Another recruit, during a troop information class on "Why We Serve," asked why he had to be in the

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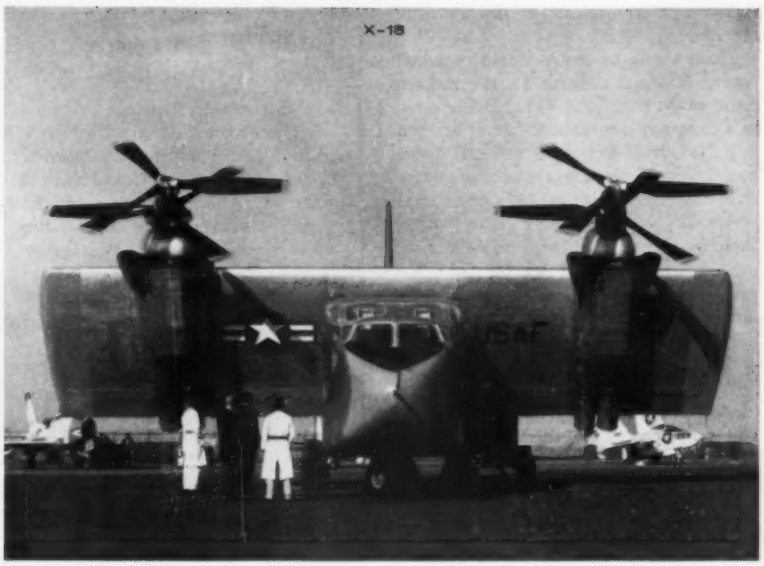

HILLER

class of ***1959***

This year new approaches to vertical flight are taking form and shape at Hiller. But what may often seem bold innovation actually is the next logical step evolved from years of experience in developing ideas into working aircraft. Because Hiller Aircraft is a major producer of helicopters, and because Hiller keeps a critical, discerning eye on many hundreds of its own ships in daily use, innovation is always tempered with the realities of production.

12E — New work horse of commercial helicopters, the 12 E is by far the most powerful in its class.

H-23D RAVEN — Dependable, multi-mission helicopter for the U. S. Army. Ask anyone from Camp Wolters about the "D."

X-18 — Dramatic new concept in air transports — the Air Force's VTOL/STOL Tilt Wing.

XROE-1 — Lightweight and collapsible, the ROTORCYCLE is now in production for tests by U. S. Marines.

IDEAS ARE ONE THING. DELIVERIES ANOTHER. BOTH COME FROM HILLER AIRCRAFT CORPORATION

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Army. His country never did anything for *him!*

I can think of many instances where parents made it difficult for the training cadre to do their jobs. One mother wrote to a company commander saying her poor boy had bad feet and needed special boots. Would the Lieutenant be so kind as to take her son to an orthopedic shoemaker and have his boots altered? Then there was the father who called his son four times a week to see how the boy was doing. When told his calls were not appreciated by the unit commander, the father said he would call his Senator at once.

Not all the troubles are caused by people outside the Army, either. Some of our own leaders do their part. A unit is scheduled for a CMI. The trainees can't help in the preparations, because training must go on. So who works a 12-hour day and then four to six hours more getting ready for inspection? The cadre—while the trainees get their rest. This goes on for a couple of weeks before inspection.

Recently an item in a service periodical told about noncommissioned officers walking private-of-the-guard because all the trainees had been sent home for Christmas. But the greatest of all bloops is when a VIP makes known that he would like to visit a training unit. The cadre works extra hours making signs like WELCOME SENATOR SNERD! This is displayed on a prominent hill near the landing strip. Problems are dry-run until they go off without a hitch—at the expense of other training. During the past year we were teaching mortarmen with one round per man. But because Senator Snerd wants to see our training, each man will fire six rounds. Not only do we give the Senator a false impression of our training, but we may hurt our own chances of getting the funds we need next year, after the Senator sees such a waste of ammo.

We limit tours of duty in desirable slots like National Guard or Reserve advisor. Why not also limit the time a man must spend in training basics, where he gets little recognition and has a smaller chance of advancement?

The men who run the training units are the heroes of our peacetime Army!

SGT. EARL WYCKOFF

El Paso, Texas

REPORT BY OUR EDITOR OF UNSIGNED COMMUNICATIONS

We recently reviewed a couple of anonymous letters and this prompts us to remind our readers that when a letter in ARMY is signed with a pseudonym or the name of the writer is withheld, we do it at the request of the writer. We realize that prudence sometimes dictates the use of a pseudonym, and don't mind if you use one so long as you identify yourself to us. Your identity will be protected, even against demands for it. We waste no time with communications signed only with a pseudonym, or not at all. These are invariably passed to our editor of unsigned communications: the janitor.

Fast-Moving Army

● What a ride I'm getting! After ten years of National Guard duty I finally came back to find out what was new in the Army. From the day of my second induction I've been on a jet-propelled program. I thought I would probably be stationed at some training division, teaching Left Face, Right Face. (After all, I'm NG, and 50 years old to boot.) Little did I know. Nineteen days after I signed in at Fort Chaffee I was on a plane bound for Korea. Fourteen days later I had a job with a battle group of the 3d Infantry way up past the 38th parallel. Since then I have moved fast and furious: FTX, CPX, FTX, CPX again. Moved by chopper, moved by APC, moved by truck.

What kind of an outfit am I in? I don't know if I'm armored, airborne or leg. And now this Okinawa keystone airlift deal. We may be the first big BG to be airlifted in toto. I don't know.

I do know this is a fast-moving Army, and I'm in the fastest-moving unit of it. I've flown so much I feel I'm entitled to wings. What a ride I'm having! The National Guard was never like this.

SGT. JACK W. ACLIN

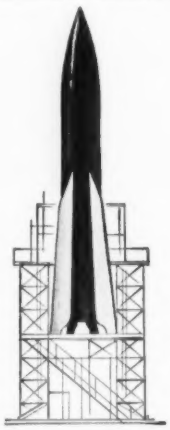
APO 7, SF

Soldier v. Lawyer

● Colonel Wiener, in his "Soldiers versus Lawyers" [November 1958], set up his case upon the most ancient citation of law he could find, and indeed was able to dig one out of the year 1311. It got him off on his thesis that somehow there is a natural antipathy between the legal and the military professions, and that there always has been and always shall be.

From this point he built his "case." He attacked the military trial counsel, the law officer, and the police (the "always inadequate and frequently vicious CID, ONI, and OSI"). This of course leads to the logical conclusion that the armed forces would be better disciplined if they "removed the administration of military justice from the cops and lawyers."

how to get
YOUR INVESTMENT PROGRAM
off the ground



The sooner you set up an investment program, the sooner you can begin using your surplus cash to earn more money now or to supplement your retirement income.

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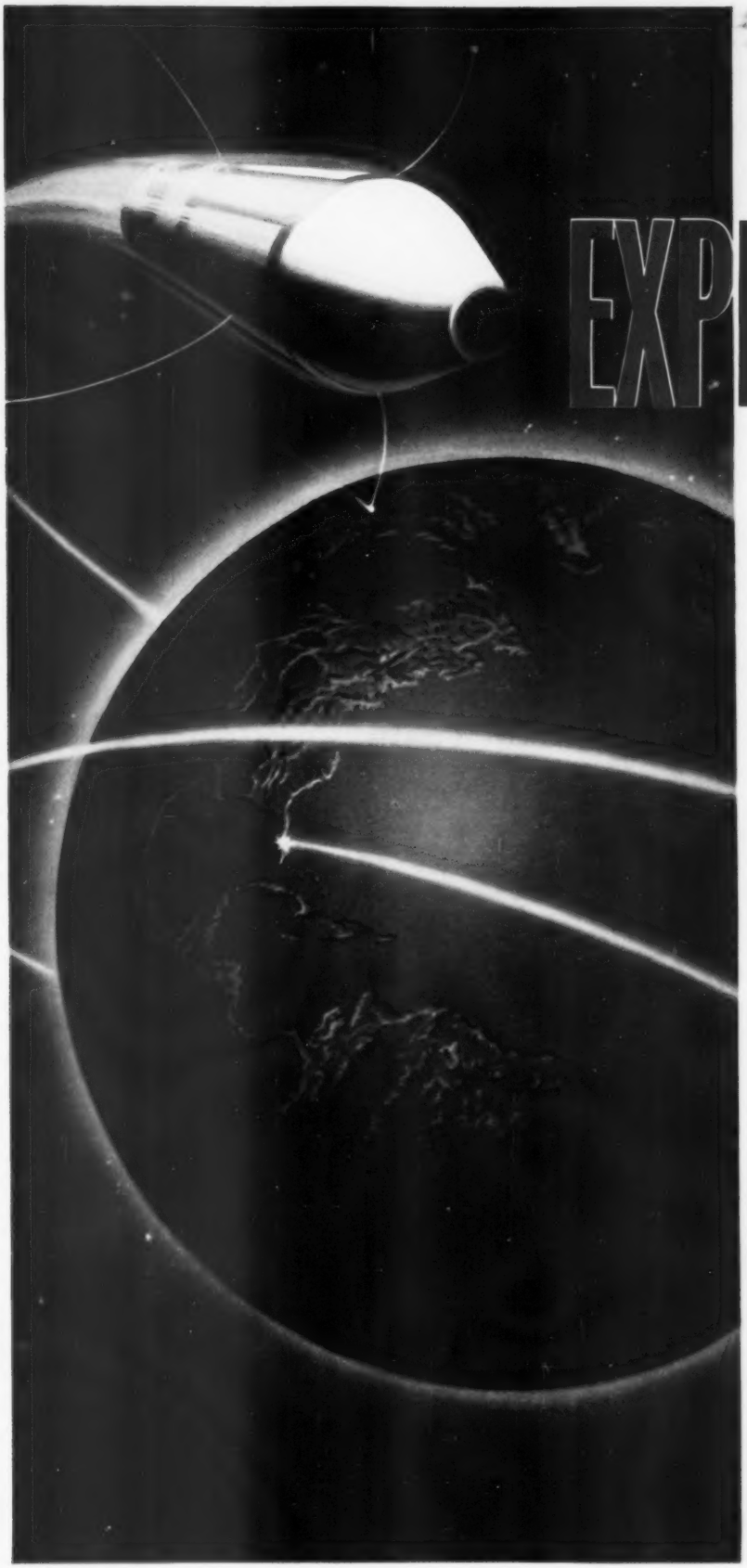

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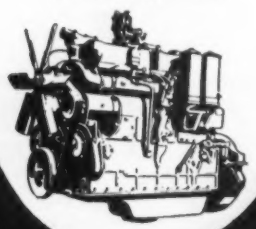

PARTS AND SERVICE EVERYWHERE

Continental Motors Corporation
MUSKEGON AND DETROIT

The proposition bears consideration on its merits. First, let it be said that a man can be a soldier *and* a lawyer. As a student at an army service school I can bring personal witness to this. The history of the Army is filled with the names of those soldiers who knew the law and those lawyers who were soldiers. The professions are not antagonistic, as Colonel Wiener would have us believe. Many of the present Regular Army JAs proudly wear the Combat Infantryman Badge, and some served in other combat arms during World War II and Korea.

Colonel Wiener indicated that there was really little left anyway for the military lawyers to handle, since the Justice-Defense agreement in the United States and the Status of Forces agreements overseas. Apparently he would extend the Status of Forces agreements to all non-military offenses. Even the State Department would not go that far.

The idea behind the Justice-Defense agreement was to limit court-martial jurisdiction to those offenses having a demonstrable bearing on military effectiveness of the armed forces. Many persons believe that most crimes by members of the military forces within the United States and all those committed outside CONUS have a bearing on military effectiveness. The fact that an accused normally is tried in his own unit is not only for convenience but for the example it sets to his comrades. Does not a theft from a barracks or a post exchange, or from the Government, have a bearing on military effectiveness? And does not defrauding the Government bear on effectiveness? Can it be denied that the sale, use, or possession of narcotics bears on military effectiveness?

Colonel Wiener next bases his case on the proposition that lawyers should not appear in courts-martial, and cites a decision of 1809. He should have heard the address by the Chief Justice of the U. S. at the 1958 convention of the ABA. The Chief Justice pointed out that in the early days of our country, widespread efforts were made to suppress the practice of law, and to administer justice without lawyers. In military as in civil courts there have been changes since the early nineteenth century. Today we accept experts and professionals in the various fields, and in the administration of military justice there is no exception. We can use the experts without the loss of essential justice either to the soldier or to the Government, and by this method will maintain discipline.

The many tasks of a commander in the nuclear age do not permit his entire concentration on personnel matters. The concern of company commanders in today's Army and the extent of their knowledge exceeds that of a field marshal of the nineteenth century. The unit commander must master subjects like nuclear fallout, electronics, missiles, government of occupied areas, and concepts and ideas not known even 20 years ago. No commander today can know all his men so intimately that he can render justice in a paternalistic fashion. Justice must be impartial, and if justice cannot be done to all men, then it is not justice. The only alternative for equal justice is that it is administered by an unbiased fact-finding group assisted by experts.

Colonel Wiener's thoughts on military justice, based as they are on fourteenth century citations, do not stand up when examined on their merits. It is always popular to tell military leaders that they can decide the fate of their men. Such theories do not stand up in the light of the facts of the military in the modern age. The commander has no time for such a system, and the American public won't permit him to play god as he may have done on the Army's frontier posts.

MAJ. JOHN JAY DOUGLASS
Fort Leavenworth, Kans.

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Advanced warhead for Nike Hercules: developed, tested and produced by Rheem

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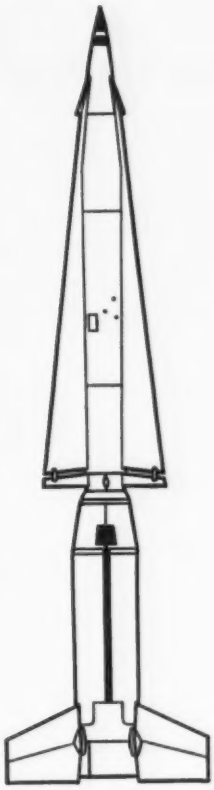
The man:

A U.S. Army missileman working with Nike Hercules missile equipment. The modern Army relies heavily on the special skills and knowledge of men like this who are trained extensively in military schools, and supported technically in the field by Army Ordnance Corps, Western Electric and Douglas field service men.

The mission:

Defense of U.S. cities. Army Nike Hercules units are already on duty at many key points...have the important assignment of guarding against enemy aircraft.



The missile:

Douglas-built Nike Hercules, product of a Douglas-Western Electric-Army Ordnance team, has successfully engaged supersonic drone targets at altitudes well over 60,000 feet. Other drone targets have been destroyed up to 100,000 feet, and at ranges beyond 75 miles.

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Irons in the Fire

Cool-Running Radio Tube

A new, cool-running radio tube, developed jointly by the Army's Signal R&D Laboratory and Tung-Sol Electric, Inc., Bloomfield, N. J., uses less than one-tenth the power of a standard hot cathode tube. The new "cold cathode" tube promises great potential reliability and could conceivably outlast any equipment in which it is used. Such tubes in future radio and TV sets might rarely, if ever, need to be replaced. Its extreme resistance to heat and atomic radiation is an important consideration in military equipment which must withstand a nuclear blast and the extreme heat of a missile nose cone. The cool tube development could lead to more efficient, simplified design of communications equipment where heating up of ordinary tubes is a problem.

Airborne Assembly by Beacon

A lightweight, air-droppable pathfinder beacon light, which can be seen for two miles on the ground by infrared means, and for five miles from 1,000 feet, has been developed by Army Engineer R&D Laboratories to mark assembly points for airborne troops. The light is mounted on a telescoping mast which extends to 23 feet in use, and reduces to 30 inches in its carrying case. Total weight is 20 lbs. Six signal lenses in white, red, amber, green, blue, and infrared are used together with a coding mechanism which employs a pre-coded sequence of four Morse code characters, manually or automatically key coded, or a continuously lighted beacon. The rig can be erected and operated by one man.

Lightweight Atomic Mortar

Davy Crockett, the Army's atomic weapon, designed to fire a warhead of less than one kiloton explosive force, and manned by a three-man crew, was designed and developed by the Army's Picatinny Arsenal, with scientists and weapons experts from the AOMC and the AEC joining in the work. It is reported that final tests will be conducted in the next few months and a beginning will be made in small-scale production.

Dr. D. Dobischek, Signal Corps scientist who discovered the principle behind the new cool cathode radio tubes, examines a bank of the tubes.

Research Aircraft Tested

The Ryan "Vertiplane," a research aircraft being developed for the Army, has successfully completed its first flight tests. Using the deflected slipstream principle to make vertical take-offs and landings, the aircraft is said to have greater forward speed than a helicopter, and is adaptable to liaison work and passenger and light cargo transportation. It is powered by a 825 hp Lycoming T-53 gas turbine engine driving two pylon-mounted, three-bladed props. With flaps fully down, and the engine under full power, the flaps deflect the prop slipstream downward to provide vertical lift for take-off, hovering and landing. In the air, the Vertiplane retracts its flaps as it picks up speed and flies horizontally.

Ryan Vertiplane, being developed for the Army on its first flight test

MOBIDIC Digital Computer

Four contracts for development and production of three more MOBIDIC digital computers, have been awarded to Sylvania Electric Products, Inc. The new, high-speed, van-mounted computers are being built in cooperation with the Army Signal R&D Laboratory. The mobile, completely transistorized computers are intended for use under world-wide field conditions. Such uses will include logistics, combat surveillance, tactical operations, scientific or analytic computation, air traffic control, and artillery target assignment.

Nuclear Power Generator

The Nuclear Division of The Martin Co., Baltimore, is conducting research and development under supervision of the AEC Office of Isotopes Development on a ground-based generator fueled by a Strontium 90 compound and designed to operate for nearly a decade without servicing or fueling. The new 100-watt device would use the same basic principle as the "SNAP-III" demonstration-model radioisotopic generator developed earlier by Martin for the AEC. Work so far has been limited to non-radioactive Strontium, which has the same chemical properties as Strontium 90, but which emits no radiation. The most practical uses of radioisotopic power are said to be with remote weather stations and aircraft warning stations.

Missile Measurement Ship

The S. S. American Mariner, a floating laboratory of electronic equipment,

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Seattle to Los Angeles . . .	70.11	61.35	28:05	8.76
New York to El Paso	116.75	113.15	46:40	3.60
Baltimore to Seattle	150.31	140.70	55:35	9.61

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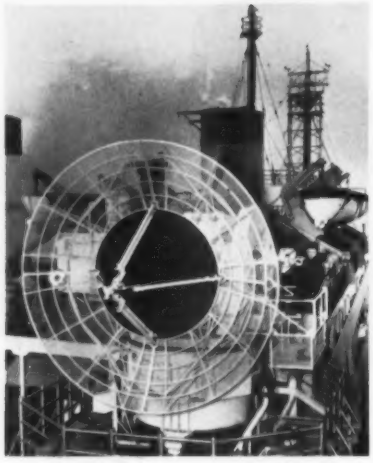

The missile measurement ship, S. S. American Mariner, boasts the largest tracking radar antenna afloat.

will take up position in the South Atlantic tracking ballistic missiles and checking their performance. The project is under direction of ARPA and the Army Ordnance Missile Command. The missile measurement ship, equipped with the latest radar, electronic and optical devices, will observe and collect data on missiles from ascent to final plunge earthward.

Retriever Adds Jump Safety

Paratroopers can jump with greater safety from the C-130 Hercules because of a safety device developed by Lockheed. Should a trooper become entangled in trailing static lines, he can be hauled back into the airplane by a retriever cable attached to two electrically-driven winches. The device, called the C-130 Static Line Retriever System, was developed at the request of CONARC. Initial tests with 400-lb. dummies (more than a paratrooper's combat weight) have proved the system's reliability.

Pratt & Whitney Engine Selected

The Pratt & Whitney Aircraft JT-12, a small, high-performance jet turbine engine, recently selected by Republic Aircraft Corp. for an advanced drone now under development for the Army, has also been selected to power the four-engine, 600 mph Lockheed JetStar aircraft. The JetStar, developed for military utility fleets, among other uses, is under production at Lockheed's Marietta, Ga. division.

Army To Buy Nuclear Plant

The Army will buy a prefabricated nuclear power plant to provide heat and power in remote, cold regions under a $3,226,560 contract between the Corps of Engineers and ALCO Products, Inc. It will be a modified version of the Army Package Power Reactor (APPR-1), built by ALCO for the Army, and now in operation at Ft. Belvoir. The weight ratio of the nuclear core in the new power plant to the diesel oil required to operate a conventional power plant is about one to 25,000. Fuel supply problems at remote sites would be greatly eased. Engineered for air movement in 20 to 30 packages, and requiring no concrete construction for shielding, the reactor can be assembled and tested in about three months.

You Talk About the Weather . . .

But the Army makes its own. In the new environmental test chambers at Frankford Arsenal, simulated rain and sunshine can be turned on and off and a wide variety of weather conditions can be duplicated to test Army equipment matériel. Made for the Army by Tenney Engineering, Inc., Union, N. J., the stainless steel environmental test chambers can produce every degree of rainfall, water and air temperature, wind velocity, humidity, and salt air. Conditions range from 20 per cent relative humidity to 100 per cent and from zero degrees to 185 degrees. The Army uses the test chambers to test the effect of weather conditions on electronic components, missile, airplane and automotive parts, chemicals, leather, wood, packaging materials, ammunition and other Army Ordnance equipment.

A retriever system which will reel back into the aircraft a jumper who becomes entangled in the static lines, promises greater safety for paratroopers

HOT SPARKS

The Army Ordnance Tank Automotive Command has signed a $3,065,123 contract with Ford Motor Co. for 1,371 nine-passenger station wagons and 422 six-passenger station wagons.

Because of the increasing emphasis on space projects, Lockheed Missiles Systems Division has been renamed Lockheed Missiles and Space Division. About half of the new study contract proposals submitted by the Division have been for space projects.

Sikorsky Aircraft Division of United Aircraft Corp. is pushing its research program in direct airlift. The program will stress research in VTOL and STOL aircraft, in addition to the company's extensive helicopter work. The goal of the program is the development of vehicles to meet the needs of modern military mobility, and a variety of cargo-carrying problems.

A pocket-sized radio receiver, system, developed for the Army by RCA's Astro-Electronic Products Division, was used in the Atlas satellite to help relay back to earth President Eisenhower's message from outer space. The ten-ounce receivers were under control of two-way communication ground stations which transmitted a coded signal to the Atlas receivers. The signal activated a tape recorder in the Atlas and the President's voice was transmitted back to receivers on earth.

The first of 50 C-130A Hercules prop-jet transports to be strengthened to withstand the stress of flying 20-ton payloads at 35,000 feet, has been delivered to the Air Force from Lockheed's Marietta, Ga. Division. Improvements in the modernization program include reskinning 30 per cent of the fuselage with thicker aluminum, a redesigned electrical system, and a 40-man hour oxygen system.

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FRONT AND CENTER

The expected reorganization of the Army Secretariat has been effected by the consolidation of the offices of the assistant secretaries for Manpower, Personnel, and Reserve Forces (MP&RF) and for Civil-Military Affairs (CMA), with Mr. Dewey Short as the Assistant Secretary. He has as assistants Mr. Franklin L. Orth as deputy for MP&RF and Mr. Edward A. Bacon as deputy for CMA. Hugh M. Milton II remains as Under Secretary, George F. Roderick as Assistant Secretary for Financial Management, Frank H. Higgins as Assistant Secretary for Logistics, Dr. William H. Martin as Director of Research & Development, and Frank G. Millard as General Counsel.

* * *

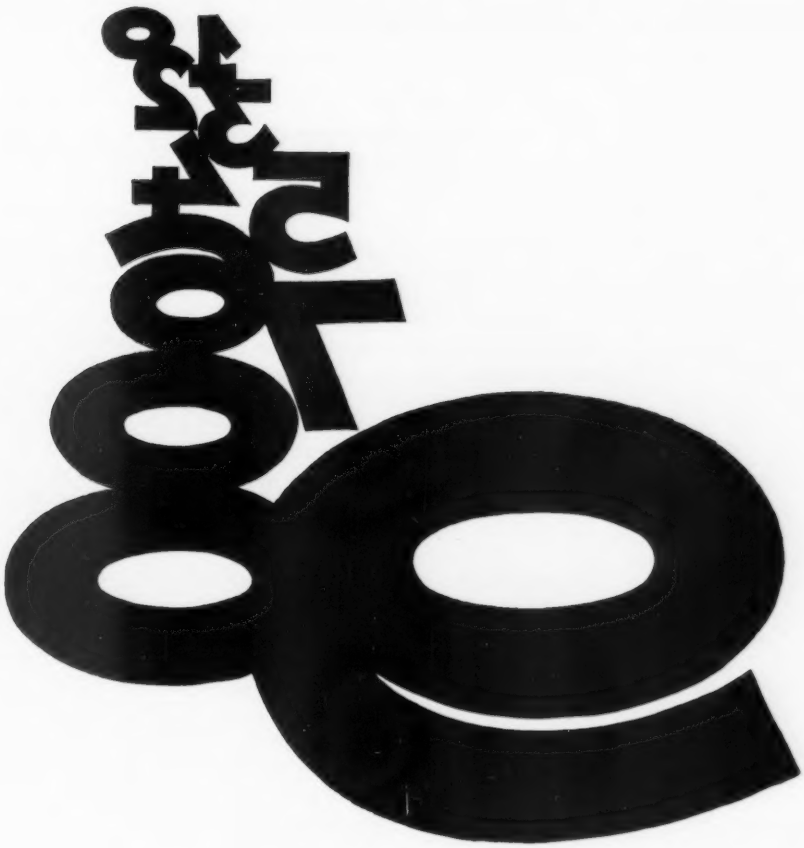
A full-scale reproduction of the Army's Jupiter C missile and the Explorer I satellite it launched into orbit, have joined the Jupiter C nose cone in a permanent home in the Smithsonian Institution. On the first anniversary of the launching of the nation's first satellite by the Army, Secretary of the

Former Secretary of the Army Frank Pace, Jr., Gen. Maxwell D. Taylor, Secretary of the Army Brucker and Mrs. Robert P. Patterson with Lt. Harry E. Warnberg after he was presented the Robert P. Patterson award as the outstanding graduate of the 1958 Infantry Officer Candidate School.

JUDGE PATTERSON'S WIDOW SPEAKS OF LEADERS WHO HAVE LOYALTY AND COURAGE

The following is taken from the brief remarks of Mrs. Robert P. Patterson, widow of the late Secretary of War, during the Seventh annual presentation of the Robert P. Patterson Memorial Award to an outstanding graduate of the Infantry Officer Candidate School.

I want to thank every one of you, both in civilian life and in the Army, who have made this award possible, and that took a great many people and a great deal of love and appreciation for what my husband was trying to do for the GIs and to make solidarity between the GIs and the officers, to build an Officer Corps and strengthen an Officer Corps with the spirit of the men among the GIs who were willing to show their responsibility, to take leadership, the real burden of being an officer. He felt that was a terribly terribly important thing. . . . In talking about the infantry, we feel very deeply that they are the service that needs a special kind of leadership in their officers. It needs men who know how to lead other men. Sometimes these men are right in the ranks, sometimes they are full of the spirit that goes forward. That is why this award to him would have been so important; that is why the Officer Candidate School meant so much to him. . . . They get discipline and they learn devotion. They learn that without leadership their company, their Army, the Service, the Nation, is demoralized. Leadership is the important thing and it must not be only the leader who has the title. If something happens to him, there must always be a next in command, and the man must feel readiness right away to follow that leadership. He must step forward and volunteer even at the risk of death. It is that kind of loyalty that wins wars and it will win the peace because the whole effort of our enemy is to disorganize us and make us lose faith and confidence in our leaders. That loyalty is what we need. Loyalty and courage.



LET'S COUNT BACK FROM THE COUNTDOWN

This is the "moment of truth." This is the countdown. A satellite will soar into the stratosphere. A rocket will hit or encircle the moon.

But let's count *back* from the countdown.

Let's count the grueling tests, the check-outs. Let's count the months of manufacturing, the skill, precision and care that went into each of the thousands of parts.

Let's count the brain-power, the engineering talents of the brilliant men at work . . . the modifications and refinements in design . . . the "breakthroughs" that had to be made.

Let's count all the way back to the first gleam of concept in a scientist's probing, inventive mind.

And let's not forget to count the administrative control, the guidance, the coordination and planning that go into these complex projects.

There's a new name for it

Such involved systems of engineering and automation demand an entirely new concept of planning, research, specialized administration and technical coordination. It is called "system management." It places complete responsibility for every phase of a giant project in the hands of one company or group of companies.

It takes tremendous resources. In manpower. In administrative capacity. In facilities. And that is why ITT has been selected for projects of the highest importance. The ITT System operates and maintains the DEW Line, and is managing the production of a new world-wide electronic control system ingeniously conceived by the Strategic Air Command for its operations.

And ITT is deep in many other vital projects.

In industry, too, there are "countdowns"

Large industrial projects, too, need system management. Vast communication networks, for instance . . . linking continents through "over-the-horizon" microwave . . . world-wide air-navigation systems . . . the development of automation in industrial processes.

System management has great potential. And ITT is equipped to put it to work . . . to assume full responsibility for complete system management projects anywhere in the free world. This includes not only basic concept, engineering and manufacture . . . but also installation, testing, operation and maintenance.

You can count on ITT . . . from concept to countdown.

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Army Wilber M. Brucker presented the 70-foot Jupiter C reproduction and its 80-inch satellite to Dr. Leonard Carmichael, Secretary of the Smithsonian. In the same ceremony, Mr. Brucker presented the Army's Distinguished Civilian Service Award to Dr. William H. Pickering, Director of the JPL, and to Dr. James A. Van Allen of the University of Iowa for their contribution to the Explorer I project. At a banquet, sponsored by the George Washington Chapter of AUSA, 17 private companies which had a part in the work, also were honored.

* * *

The 1958 Robert P. Patterson Memorial Award, given annually to the outstanding graduate of the Army's Infantry Officer Candidate School, was awarded to Lieutenant Harry E. Warnberg by Secretary of the Army Wilber M. Brucker in the presence of the widow of the late Judge Robert P. Patterson who served as an infantry captain in World War I, was Under Secretary of War during World War II, and Secretary of War in the immediate post World War II years. The award is based on qualities of leadership, academic efficiency and character. It consists of an engraved automatic pistol, a check for $250 and a scroll. The trust fund which finances the grant was contributed by friends of Judge Patterson.

* * *

General Taylor was putting the Army's Fiscal Year 1960 program in the best possible light when he described it as "essentially a horizontal projection forward of the levels of spending of former years." This is clear from his statement to the Senate Armed Services Committee.

In it we learn that most Army missile programs, both in research and development and in production, will show no increases and in some areas decreases over former years. The one exception is R&D funds for the Nike Zeus antimissile missile project (no Nike Zeus production funds are available). The replacement of Nike Ajax batteries with Nike Hercules will take several more years than planned since procurement money available for surface-to-air missiles is less than in Fiscal 1959 and 1958. At the present rate of buying it will be three years before the Army has as many as 15 of the excellent Hawk low-level SSM battalions. This mobile missile is needed by the Army for its overseas forces and for STRAC units.

The same picture emerges in surface-to-surface missiles. Two Redstone missile battalions will be deployed and one maintained for training purposes in the U. S. Some Sergeants will replace Corporal and the shorter-range missiles—Little John, Honest John and Lacrosse—will hold their own.

The reserve stocks of ammunition built up during the Korean war are dwindling and new procurement of ammunition including 7.62mm NATO rifle ammunition is necessary. Some M14 and M15 rifles will be purchased and also some of the new M60 machine guns. Too few aircraft for Army use are in the budget.

For instance, plans call for a tactical transport company consisting of 16 aircraft in each field Army and Army Corps and yet the 1960 budget provides for only seven Caribou tactical transports. An insufficient number of ground vehicles—tanks, armored personnel carriers and trucks—to modernize the Army are in the budget.

* * *

The British are planning to equip their Army with short range nuclear weapons and two regiments are being equipped with the U. S. Corporal guided missile.

* * *

On the first anniversary of the launching into orbit of the Army's Explorer I, 17 companies were given plaques in recognition of their contributions to the successful project. Here Mr. Brucker presents one of the plaques to Mr. Thomas F. Morrow, a Chrysler Corp., vice president.

General Officer Shifts

Brig. Gen. RALPH J. BUTCHERS to Armor Center . . . Maj. Gen. LAWRENCE R. DEWEY to Army Audit Agency . . . Maj. Gen. WILHELM P. JOHNSON to Armor Center . . . Maj. Gen. EDWIN J. MESSINGER to OJCS . . . Maj. Gen. JOHN L. RYAN to Pacific Command . . . Brig. Gen. WILLIAM O. BLANDFORD to 4th Infantry Division . . . Brig. Gen. THEODORE J. CONWAY to USAREUR . . . Brig. Gen. CHESTER B. DEGAVRE to MAAG, Ethiopia . . . Brig. Gen. FRANK S. HENRY to OTAG . . . Brig. Gen. CARL I. HUTTON to Federal Aviation Administration . . . Brig. Gen. PETER SCHMICK to USAREUR . . . Brig. Gen. BERTON E. SPIVY to Eighth Army . . . Brig. Gen. JAMES K. WILSON to Third Army.

Retirements. Maj. Gen. MAX S. JOHNSON . . . Maj. Gen. HALLEY G. MADDOX.

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Keeping the Deterrent on Target

AS the Congress (and the country) debated the "missile gap" there appeared a tendency to equate the military security of the United States with the number of manned bombers and long-range missiles we now have or hope to have soon. To say that this misses the target of national security requirements is not to discount the importance of our strategic air retaliatory forces, whether aircraft or missiles, but to suggest that the elements of the problem are much more complex than the simple equation of more air striking power equals more deterrence.

As Albert J. Wohlstetter of the Rand Corporation points out in the January issue of *Foreign Affairs,* to conceive of the problem in terms of more weapons "has meant confusing deterrence with matching or exceeding the enemy's ability to strike first. . . . To deter an attack means being able to strike back in spite of it. It means, in other words, a capability to strike second."

When war planners in the Kremlin look at Target United States, they must be perplexed by the missile gap debate. It would seem that to the Russians the problem reduces itself to calculating whether they have the capability of knocking out so much of our retaliatory force as to assure them that they could absorb whatever punishment our remaining strength could inflict.

Whether the Russians calculate that they have this capability today or will have it at some future date we have no way of knowing. But we do know that the present state of the art of weapons technology makes the calculation easier for them (plus the fact that we do not or cannot keep the location of our bases and missile sites a secret). In the first place, neither manned aircraft nor the present generation of liquid-fueled missiles can be effectively protected from enemy air attack. Secondly, our early warning systems can be knocked out. Thirdly, dispersion has a limited value because the vital communications systems that tie them to command control centers are susceptible to destruction.

THE proper target of our concern is not the matching of weapons with the Russians but the creation of what has been called an "offensive-defensive mixture" of weapons and strategies that will provide a far more effective deterrent than reliance upon mere numbers of bombers and ballistic missiles.

This offensive-defensive mixture of weapons and strategies consists of SAC's retaliatory bombers and missiles; of our air-defense system, including an anti-missile missile; and our other retaliatory forces of the ground and seas services.

The most important first step is to accelerate the production of the Nike Zeus antimissile missile. Along with this, an increase in Nike Hercules batteries is essential in order to protect SAC bases and industrial centers from the attacks of manned aircraft loaded with small atomic weapons.

Other measures would look to improvement in our early alert and warning systems, communications networks, and include methods of protecting these systems from enemy attack; also the acceleration of the development of solid-propellant missiles which can be placed in "hard" sites or on mobile platforms.

FINALLY, but equally important, there are the other deterrent forces—ground, sea and air—that have been largely overlooked during the debate over the missile gap. It is unfortunate that these contributions to the deterrence of Communist aggression always come last in the listing of U. S. requirements. There is ample evidence that the Communists prefer creeping aggression and all that the term implies, to all-out global war. They have reason to believe that this promises greater results at less cost. Up to now, with few exceptions, it has been overwhelmingly successful. It may well be that if the Communists win, historians of some distant date will write that we lost because in our preoccupation with global nuclear war and the costs of defense we permitted ourselves to be nibbled to death.

To reassess the fearful possibilities of this and to demonstrate that the security of the United States requires a larger U. S. Army, armed with improved weapons, the Association of the United States Army is preparing to publish an updated version of its pamphlet, *The Security of the Nation,* which was first published two years ago. Excerpts from this new edition begin on the facing page.

The Security of the Nation

IN PREPARING this statement of the views of the Association of the U. S. Army on the critical problem of how the security of our nation can best be maintained, we have started with the basic principle that wars are fought for control of land areas and the people who inhabit them. This basic principle guides the warmaking functions of the nation and is the reason why the primary mission of the U. S. Army is, in official language:

> "To organize, train and equip Army forces for the conduct of prompt and sustained combat operations on land. Specifically: to defeat enemy land forces and to seize, occupy and defend land areas."

In the considered opinion of the Association of the U. S. Army the following concepts and requirements must be accepted if the U. S. Army is to perform the mission assigned to it.

1. A land army is the only military force capable of defeating an enemy's land army; occupying key enemy areas; and controlling the enemy peoples who inhabit the areas.

2. Land armies have a necessary role in the deterrence of global war. If we have the capability of committing army forces in adequate strength with maximum speed they will be an effective deterrent to local or limited armed aggression and especially so, if our Government's determination to use them in opposing armed aggression is made unmistakably clear to the world.

3. To be most effective as a deterrent and to have the capability of playing its full part in winning wars of any magnitude in which the U. S. may become involved, the Army must:

Maintain its separate identity and have full opportunity for the expression of its views in the highest executive and legislative councils of the Government;

Have properly balanced active forces in being, trained and equipped for rapid commitment at any place and time, and have behind them reserve forces organized, trained and equipped so as to be capable of rapid mobilization and deployment in support of the active Army;

Have positive assurance of the availability of the means to deploy its forces swiftly in an emergency. As a minimum there should be available sufficient strategic airlift to fly all airtransportable elements of two divisions from the Continental U. S. to any place on the globe and to sustain them until rapid sealift can take over the task of supplying and reinforcing them.

4. To support and sustain the active and reserve components of the Army and to maintain the capability of rapidly and efficiently enlarging the active Army as the national interests may demand, the Army must have the means to:

Operate an effective training and school establishment;

Provide the technical and logistical support necessary to sustain it wherever it may be deployed or committed;

Arm its forces, active and reserve, with the most modern and effective weapons and equipment we can produce;

Carry out an adequate and progressive research and development program;

Use every available weapon and vehicle without artificial and illogical restrictions that hamper the fullest possible development of such matériel, and without restrictions on their tactical use in combat; and

Develop to the fullest possible extent land-based surface-to-air defense weapons for the protection from enemy air attack of its field armies and vital areas of the United States.

In the sections that follow, these concepts and requirements are developed within the framework of the principle enunciated at the beginning of this section.

How Large an Army

Manpower Requirements

THE MANPOWER REQUIREMENTS of the United States Army derive from the missions assigned the Army. Today these missions include active forces committed to Cold War tasks and the maintenance of a mobilization base on which a general-war force can be built if it becomes necessary.

The Army's active forces include:

- Forward deployed units stationed principally in Europe and Korea;
- Training and advisory groups assigned to the nations of the free world which receive U. S. military aid;
- A strategic striking force;
- Logistical forces capable of supporting these categories of active forces;
- Active units assigned to training centers, schools, and Army Reserve and National Guard units.

Army Reserve and Army National Guard units constitute the mobilization base for building up to the requirements of a general war or extended limited conflict.

Our forward deployed forces constitute a clear warning to the Communists of our determination to stand with our allies in resisting aggression. The deterrent value of these forces is self-evident: the Communists have started no aggression in areas where U. S. troops are stationed. The present strength of the forward deployed forces of the U. S. Army is at a post-Korea low and represents a hazardous calculated risk.

The Military Assistance Advisory Groups assigned to smaller nations increase the military capabilities of these nations. In addition to providing the essential know-how of U. S. weapons and equipment furnished these nations, these groups are a valuable instrument for transmitting professional attitudes and esprit.

The existence of strategic striking forces provides us, as General Bruce C. Clarke has said, with forces "sufficient to enable *rapid reaction* by use of *measured force* where and when required." This is the purpose of the Strategic Army Corps (STRAC).

"Rapid reaction" means the ability to back up forward deployed forces of the free world with fast-moving, hard-hitting, fighting units.

"Measured force" means the capability of assigning the appropriate force to the mission in hand. STRAC is so organized as to be able to commit to action a single battle group or several divisions with supporting missile commands and other units.

Every successful commander has been vitally concerned with the supply of his army since strategic and tactical success depends upon the undiminished flow of food, weapons, ammunition, and other essential supplies and services.

The logistical problems of modern armies are more complex and difficult—and vital—than ever. Modern weapons and vehicles require more extensive and highly specialized maintenance. The dispersion of combat units over a greater depth of battlefield greatly increases the problems of the supply system, especially in transport. The logistics system of modern armies requires more manpower than ever before.

No army can be better than the schools and training establishments that produce it. Sufficient manpower to operate such facilities is a basic requirement, necessary not only for the active Army but for maintaining a base on which to build a general-war force if such should become necessary. The maintenance of an adequate high-performance school and training system requires limited numbers of highly skilled persons. Any impairment of these important functions is obviously not in the best interests of the United States.

Before analyzing the present strength of the U. S. Army in the light of the requirements set forth here, we should first consider the argument that modern war will require fewer men in uniform.

More Men, Not Fewer

WHILE THE EXISTENCE of millions of Russian and Chinese soldiers under arms does of itself consti-

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RADIOPLANE RP-77D SETS NEW DRONE ALTITUDE MARK!

New holder of an unofficial world altitude record for propeller-driven drone aircraft – Radioplane's RP-77D aerial target. This record-breaking bird climbed to more than 46,000 feet during Army evaluation at Dona Ana Range, Fort Bliss, Texas.

Sidelight on the flight: the record-setting drone had six previous flights to its credit – is ready for further action after its seventh recovery by two-stage parachute.

Rocket launched, Radioplane's RP-77D is turboprop powered to speeds in excess of 400 miles per hour at above 40,000 feet – and is capable of flight duration exceeding one hour at this altitude. Relative to performance, it is a low-cost target. Constructed almost entirely of fiberglass laminate, the RP-77D has an additional capability for photo and television combat surveillance missions.

Other current Radioplane drones in development are the supersonic USAF XQ-4A weapon evaluation target and the XKD4R-1 rocket target for the U.S. Navy – two more members of the world's only complete drone family.

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tute a logical reason why the United States needs an army strong enough to wage limited conflicts and provide a shield in the event of general war, they by no means constitute the only reasons.

Theoretically, these millions could be bombed out of existence if they were so massed as to provide lucrative targets. Since this possibility is highly unrealistic, it follows that the armies of the Soviet Union and other Communist nations can be defeated only in land battle.

However, the battlefields of future war will be greatly dissimilar to the battlefields of the past.

To avoid the massing that would make lucrative nuclear targets, many small but powerful fighting forces will be dispersed widely and in great depth, with the intervening spaces protected by tactical nuclear firepower from mobile artillery—guns and missiles—firing from positions as close as 20 miles or as distant as several hundred miles from the target.

This kind of dispersion will be necessary whether the atomic or non-atomic weapons are used. There are two reasons for this.

While dispersion is a military disadvantage the very existence of nuclear weapons forces this kind of deployment. Any commander of the future who masses his forces, even for a short period, will be tempting his opponent beyond reason.

Dispersion will also be necessary because of the increased killing power of conventional weapons. Experienced tacticians have said that dispersion beyond World War II practices would be required today even if nuclear weapons did not exist. One manifestation of this is the proximity fuze which appeared late during World War II. This almost-forgotten scientific achievement brought to U. S. artillery an advantage against small masses of enemy that could be countered only by dispersion.

Dispersion will not decrease the need for the men who wield the weapons—infantry, armor, and artillery—and will increase the numbers of men required to supply the fighting units: the logistical problems of the technical services will be many times more difficult than they were in the Second World War. Modern weapons and machines require more extensive and highly specialized maintenance.

It is as true of armies as of industry that while automation may decrease the need for unskilled workers, it greatly increases the need for skilled operators and maintenance people. But the compensating advantage to industry of much greater production at a lower cost per unit does not, unfortunately, follow in war. The greater use of military automation may be offset by corresponding increases by the enemy. The natural counter to this is, obviously, more men to man more of the machines that create greater firepower. In war between two major powers, the total resources of the contenders will necessarily have to be mustered. Anything less would be an invitation to defeat.

All of this is so whether the conflict is atomic or nuclear-free. And it is applicable in a limited sense to less than total war. The assertion that modern weapons will require fewer men in uniform is illogical. It also flies in the face of the facts of history.

If it were true that increased firepower per soldier results in the need for fewer men in uniform, the First World War should have been fought by fewer men than were committed during our own Civil War, and the Second World War by fewer men than were engaged in the First World War.

The theory that fewer men will be needed in war is nonsensical not simply because it ignores history, but because of its disregard of the essential nature of war. Wars are not won by slide rules and electronic computers, but by human beings. Wars are not won by automatic supersonic weapons carrying megatons of destructive force in their warheads, but by human beings. Whatever the objectives of the war may be, they cannot be achieved until the enemy's military power is vanquished, key points in the enemy's territory occupied, and the enemy's peoples brought under control.

In the case of conflicts in which the objective is limited, success is of the same measure: defeat of the enemy's military power in the area, occupation of key areas, and control of the people in these areas.

Machines and firepower cannot do this. It can be done only by trained and disciplined men.

Well-armed and determined enemy land forces that are well versed in fast-moving group-and-strike tactics followed by dispersion before grouping to strike again, can be defeated only by integrated ground-air forces.

Machines are important but the armed men on the ground are the vital force. Though this is an unpalatable thought to a nation that prides itself on devising machines that can replace muscles, it remains irrefutable. Not all Americans realize this. In their desire to accept a cheap route to security

(Continued on page 50)

Preserver of Peace . . .

ATLAS

Air Force "Sunday Punch"

Boosted into space by the fiery thrust of three huge rocket engines, the seven-story Atlas intercontinental ballistic missile roars upward from its Cape Canaveral launching pad. Quickly it sheds the frost encrusting the liquid oxygen tank and races to its predetermined destination in the far reaches of the globe. In its size and range and capability, the Air Force Atlas is a commentary, for all the world to heed, of the necessity to maintain the peace. RCA's Missile and Surface Radar Department has been privileged to design and develop ground check-out, launch control and cabling equipment as a major subcontractor to Convair (Astronautics) Division of General Dynamics Corporation, the Atlas prime weapons systems contractor.

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Industry and the Arsenals

DR. WILLIAM H. MARTIN
DIRECTOR, RESEARCH & DEVELOPMENT, DEPARTMENT OF THE ARMY

This article is drawn from a talk by Dr. Martin at AUSA's recent symposium at Fort Bliss, Texas

THE scope of the Army's interests in development and production covers a wide range of weapons, ammunition, tanks, support equipment, vehicles, food, clothing, and all the other things that are required to maintain an army and to fight an enemy. Our interests cover, and must continue to cover, the kinds of things which we call conventional and also the newer things, such as missiles, electronic systems for various purposes, and atomic warheads.

With this wide variety of fields which are involved in the Army's operations, it is natural that our interests are broad and that our procedures for providing the end items may vary from category to category. Some of the items are simple, some are well-established, some are in common use in industry, and some are highly specialized, extremely complicated and are the result of pushing the technology and the production skills to the limit. Additionally, the time scale for procurement of many of the established items permits routine procedures with all the customary detailed specifications, competitive bidding, orderly spaced delivery, and simple qualitative and quantitative inspections. At the other end of the scale, we have the development and procurement, for urgent operational availability, of some of the most complex and expensive technical devices that man has been able to conceive. Our procedures and practices for getting all of these items have been based largely on laws and regulations evolved over the years of procuring established items in times of peace.

Some of the concepts and practices were brought about by the public post-World War I attitude toward the manufacturers of the munitions of the time. Industry wanted to—and did—get out of the business that aroused the designations of "war mongers" and "merchants of death"—at least until the next war came along to call again for their skills and experience to be used for the national survival.

With this situation, the "arsenal system" became the munitions business for supplying rifles, guns, ammunition, and so on, in peacetime and the foundation on which to erect and expand production into industry in wartime. The experience of World War II indicated that some of the specialized facilities created for this expanded production should be kept available for use if we had to meet another emergency.

World War II also created huge demands for entirely new kinds of devices such as radar, electrical gun directors and bombsights, and various new kinds of radio. Since the war, we have had guided missiles, atomic warheads, computers, data processing, and so on. These have become munitions and the business has become scientific, sophisticated, and long-haired. The best minds seek occupation in this business and are proud of their accomplishment in devising weapons of destruction. It is now respectable and profitable to make a living out of the development and production of the tools of warfare. And under our present day conditions, that is as it should be.

This evolution has created a duality in the munitions business—one provides for the supply of the older types of weapons and support equipment and the other which began expanding during World War II has grown like Topsy since then to meet the demands of the cold war for the newer types of war tools.

So, we are running a double show. In one ring we have the unglamorous workhorses and the various devices for using the old Chinese invention of gunpowder. Of their virtues and shortcomings we are well aware. In the other ring, we have all kinds of weird birds and up-dated concepts of mythology which provide any kind of performance that you can imagine. Incidentally, if you can get delirium tremens and come up with some lurid vaporings, you can find some scientists, real or self-designated, who will promise to match them and go them one better by tomorrow. These also, we have to know how to handle.

Criticism of 'arsenal system'

While there are some who claim that the first ring is of interest only to the historians, some of us still believe that both rings need to be equipped for the next show. So, seriously, we need to know how to run such a double show.

This evolution has naturally called for some changes in our concepts and our procedures. These, I want to discuss here.

Some weeks ago, *The New York Times*, reporting on a dinner speech by the head of one of the largest industrial companies of the country, stated that he took issue with those who advocate the arsenal system for missile development. Under that system, it was stated, new weapons are developed solely by Government agencies; industry takes over after the weapon is ready for production. The article went on to quote the speaker:

> The arsenal concept is, of course, a workable proposition as applied to simple standard items as rifles, torpedoes, artillery or ammunition. But in the far more complex weapons systems we are dealing with today, such a method could very easily lead to technological stagnation, prolonged development delays and inefficiency.

Also, recently, the *Army-Navy-Air Force Journal*, in reporting on the award of an Army missile contract to a large industry stated that: "Heretofore, the Army awarded missile contracts under the arsenal concept with the Army as prime contractor." It went on to state that this contract is different; industry holds the prime responsibility. Also, it said, "This award provides the Army an opportunity to derive maximum benefits from its arsenal system and from industry. If the joint effort clicks, there will be more such combining of military-industry resources at the R&D level."

Now, here's where I take off. What is this arsenal concept which is being so criticized and how is the Army using it?

Let's take missiles. The contract for the Army Nike-Ajax, the first of the NIKE series of missiles (Ajax, Hercules, and Zeus), was initiated in 1945 with industry as the prime contractor for development. Hercules and Zeus have followed the same pattern with the same contractor team. The Hawk missile has had an industrial contractor as prime from its inception. Lacrosse has always been outside the Army and so was Dart. Corporal and Sergeant were developed by the Jet Propulsion Laboratory, a contractor to the Army, but not a part of an arsenal, and the production was by industry. Pershing has, as indicated, an industry contractor for the development. Redeye has an industrial contractor for development. All the current Army missile proposals are now being studied by industry and it is planned to have industry prime contractors for each of them.

The two Army missiles which have been developed with the arsenal as prime contractor for development are the Redstone and Jupiter. You may be aware of why this was the case for these two missiles, but I shall go over them to insure against further misinterpretation.

All of us know the story of the Von Braun group: their location at Fort Bliss after World War II, their experiments with the V-2 missiles, their establishment at Redstone Arsenal to develop on the basis of their techniques and experience a ballistic missile to carry an atomic warhead. In developing this, facilities of the order of over $40 million were created at Redstone Arsenal and a contractor team was set up of Chrysler, Thiokol, Ford Instrument, and Reynolds Metals to assist in the development and to prepare for production. This missile was the prototype of the general concept of the present liquid propellant ballistic missiles.

When the IRBM projects were authorized over three years ago, the prime objective was minimum time to availability. Consequently, the decision for the Army project, the Jupiter, was to proceed along the line of an extrapolation of the Redstone Project to the 1500-mile range with the same team, facilities, and industrial contractors. The team and facilities were increased in magnitude and the result was the operational availability of the Jupiter within three years.

It is not the intention of the Army to have the Redstone-Jupiter pattern be that for future Army missiles, or even for ballistic missiles. For the solid-propellant Pershing, the prime contract is with industry, with provision for utilizing the facilities and skills at Redstone. Thus, the Redstone-Jupiter pattern is the exception, rather than the Army rule. Furthermore, the Army has no plan for the development of any missile in an arsenal.

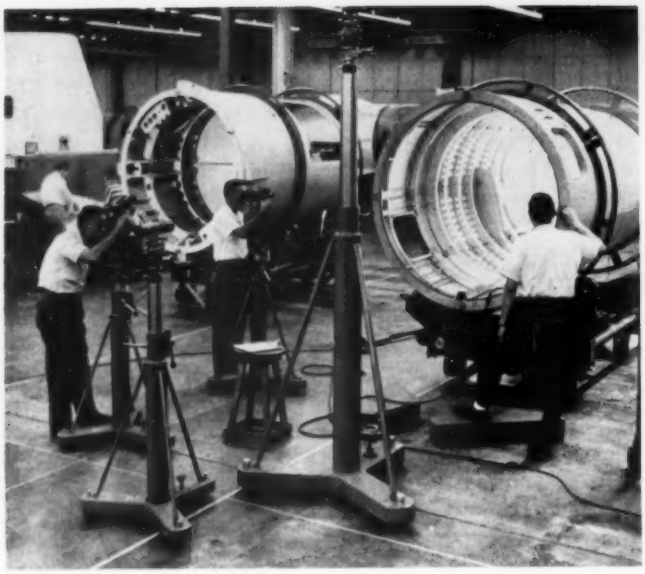
Going beyond missiles, I will mention a few other items for further illustration of Army practice. The Missile Master for coordinating Nike batteries was industry-developed and produced. The same is the case for Missile Monitor for the field armies. The Tactical Operating Center is being developed by industry. The new quarter-ton utility vehicle was developed by Ford, and current truck proposals, and engines for them, are being worked on by the automotive industry.

The Army arsenals are under the Chief of Ordnance. He testified before Congress last year that it was planned to spend in Fiscal 1958 through the arsenal system approximately $2 billion, of which 90 per cent would go to industry. Taking Redstone Arsenal, which handles the Army's missile program, only 12 per cent of its funds are expended within the Army. I give you these few figures so that if you hear claims that the Army, because of its arsenal system, is not giving a sufficient portion of its business to industry, you will know that it is not so—and I hope you will say so.

This is the 'arsenal system'

What I have said must not, however, be taken to mean that the Army is washing out the arsenal system. Rather, I want to stress what the arsenal system is—to define the current arsenal system.

The Army has certain responsibilities in research and development and production fields which it must meet and which the Army will not and should not try to delegate to contractors. The Army must take the responsibility for determining what is needed, and how and by whom it is to be provided. Its personnel should monitor the program, through development and production, to ensure that its progress and results, including whatever modifications are necessary or desirable, are all in the



PARTNERS IN MISSILE PRODUCTION. Chrysler technicians in Detroit check components of the Redstone missile (left); Nike Hercules missile move through the

best interests of the user—the combat forces of the Army. Also, when the end item is available, the Army should evaluate it to determine if it suitably meets the requirements of the user. The skills and experience to carry out these technical responsibilities must be organically in the Army. A most important concept of the arsenal system is to provide these skills.

Another important concept is that of insuring that there are and will be in times of stress, sufficient facilities and production skills to meet the demands, particularly for high consumption items such as ammunition.

An additional purpose of the arsenal system is that it should provide a repository for the information required to produce Army equipment and of the underlying peculiar knowledge and art during times of little or no procurement activity. This provides a basis for reinitiating or expanding production as may be needed.

It should be noted that to keep "interested" and "hot" the skills required to meet these responsibilities, there needs to be a certain amount of in-house original work. Otherwise, these organic skills tend to be based solely upon the experience of the past. Also, it should be noted that these "in-house" facilities are available to be called upon in emergencies, to provide urgently needed items or components, without taking the time to go through the normal procurement procedures, which may, at a minimum, take some months.

The Army believes that reliance for the development and production of our war tools must be based primarily on an industry-military team, with assistance in the research and development areas from universities and non-profit organizations working in these fields.

Cooperation of this kind inherently must be based, to be effective, on the respect of each member of the team for the competence of the others to carry out their respective responsibilities.

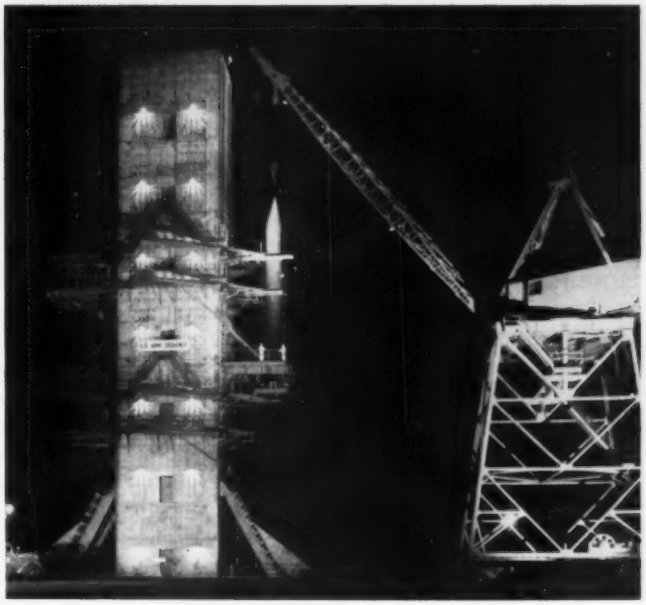
The purpose of the arsenal system is to provide a properly organized, systematic capability for taking care of the Army's responsibilities in the operations of the Army-industry team. It is not the purpose of the arsenal system, as some appear to have assumed, to displace industry from that team, either for development or for production.

So much for the concepts of the arsenal system. As I have told many of our contractors who have primary contracts for Army weapons and associated equipment, we depend upon their being active expositors of the Army's method of operation. Such contractors are in position to know how we work and want to work.

Lead time

No discussion of this kind would be complete today without touching upon the very vital problem of lead time, *i.e.*, the *interval* of time between *wanting* and *getting* a new item of military equipment. We know that we have got to take the necessary measures to reduce this interval, which all too often has been eight to ten years.

We in the Army have been and are currently devoting a lot of attention to this matter, both in individual agencies of the Army and by joint sessions of several agencies. I stress this joint session, because our approach to a better solution of the lead time problem has got to be on the basis of a closely integrated team operation, not only between the military department and industry, but also between the various agencies in the military



assembly lines at the new Douglas plant in Charlotte, N. C. (center); a Redstone missile is lowered into position on the static test stand at Redstone Arsenal, Ala. (right)

department, on the one hand, and on the other, between the several contractors in industry.

In this discussion of lead time I am referring to the development cycle extending from the time that authorization is given to develop a specific item, to the time when this item is operationally available to troops. I want to emphasize that, in what I am saying from here on about measures to reduce lead time, I am pointing especially at the large complex weapons and systems which are so vital in our current programs. The extent to which these measures should apply to the simpler and more conventional items should be determined by their urgency and priorities.

Before getting into the development cycle, I should say that a most important factor in minimizing this is to have continuously available a well-filled reservoir of new technological concepts and information such as will be provided by a good, broad program of basic research. Along with this, is needed, also, a forward-looking development program of long-lead-time essential general-purpose components. With such a reservoir of knowledge and components, we are in a position to get under way quickly on a new project for a specific item, without having to wait or back-track to do the research and development to select and carry out a proper procedure toward the desired goal.

The proposal for the authorization of a design development should be accompanied by a properly comprehensive project plan which proposes and defines the specific development of the design of the new item, giving the information needed to promote its authorization and estimating its required support in resources, skills, facilities and collateral activities. This project plan is the endeavor to think through the program and schedule of the proposed development, in order to provide the proper basis for an intelligent judgment by those who are called upon to authorize the development, determine its priority, and provide the necessary resources.

To minimize the lead time there must be close coordination and concurrency in the preparation for production with the development of the design itself. The primary method for achieving this objective is to have the development organization responsible also for the preparation for production, the initial production, and the provision of the support material required for its operational use, namely, manuals and associated equipment for installation, operation, maintenance, training, and the like.

This concurrency of development and preparation for production is particularly critical when automation is to be employed in production. The design of the device to be made by automatic machinery must be compatible with the design of the machine and the designs of both must be coordinated and therefore preferably concurrent. This is especially necessary in the microminiaturization of electronic parts in order to achieve the required low costs and high reliability.

Military characteristics

It must be recognized also that the goal of the development project has not been attained until an acceptable item has been produced and tested. This means that the development cycle extends into the initial production lot and should include the incorporation into the design of the important changes which the experience of early production and use indicates are necessary and desirable.

It is also most important, during the development cycle, to have arrangements for close relations between representatives of the using and logistics agencies, and those of the developing agency of the Army and the contractor, so as to insure that the interests of both of these receive proper consideration throughout the development cycle. This is particularly necessary, when, as is desirable, the stated military characteristics are to be treated to the maximum extent as objectives which can be modified during the development in the interest of reducing costs, shortening the development cycle, simplifying the equipment, improving technical performance, reducing maintenance, and so on. It should be an obligation of the development agency to review with the contractor what may be accomplished by relaxing these requirements and arranging for their modification where this is justified. On the other hand, the contractor also should be aggressive in pushing for such modifications where he considers that they would accomplish these results. The Army has recently put into effect a regulation which gives the Chief of Research and Development the primary staff responsibility for determining and modifying these characteristics.

It should be noted that to make most effective these inter-relations between the several Army agencies and the contractor, calls for the good leadership of a competent project manager in the Army.

Before closing, I should like to summarize the objectives which I recommend for the reduction of lead time in the development cycle and for attaining a more suitable end item from the standpoint of the overall interests of the user. Because of some comments which I have received on earlier presentations, I hasten to state that these are objectives and not regulations to be applied to every project regardless of its magnitude or urgency. I stress, however, that they should be valid for the more important initial projects and that there should be, in general, good reasons why they should not be sought.

So, having in mind especially the major weapons where early availability is important, the recommended essential objectives for having the development cycle provide an acceptable item in the minimum time are that:

1. The basic research and component development programs be adequate to have available a suitable reservoir of new knowledge, concepts and components.

2. A well-drawn project plan be provided for the authorization of the development project.

3. The development cycle extend into the production of the first lot until an acceptable item has been produced and tested.

4. The responsibilities for development, preparation for production, initial production and the support material be placed on one contractor.

5. The Qualitative Military Characteristics, to the maximum extent, be objectives throughout the development cycle, with primary responsibility in the Army R&D agency for seeing that they are properly adjusted to the dictates of the available technology, economical quality production, reliability and timely availability.

6. The representatives of the logistics and user agencies have close relations with the Army development agency and the contractor to insure that their interests are properly effective in the development of the design.

7. For each such major project there be a project manager in the Army development agency responsible for the progress of the project and for the proper participation of the representatives of the logistics and user agencies.

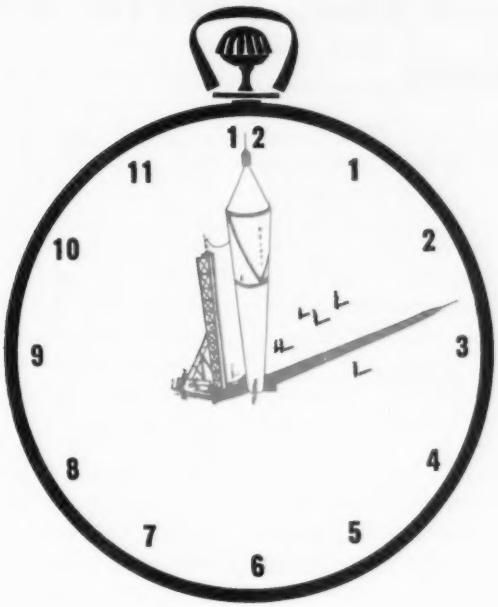
8. The cycle from initiation of the development to operational availability of an acceptable item should be not more than four years.

9. The funding rate be what is needed to meet this four-year cycle.

These objectives recognize that the development project is a team operation involving the supply and using agencies of the Army, as well as the contractor and the Army R&D agency, with the latter having the primary responsibility throughout the development cycle. The key factor in attaining the goal is that the members of the team be motivated by a sense of urgency and an eagerness to cooperate with each other.

I am glad to state that much progress has been made in the Army in the acceptance and implementation of these objectives. More progress should be striven for in the interests of better end items in less time and at less cost. The attainment of some of these objectives calls for changes in some of the current concepts, procedures and regulations. Such changes, I know from experience, may take time. Here again those in industry can help, particularly by demonstrating their effectiveness by the results produced in carrying out contracts.

We, in the Army, want to broaden our support in industry for the development and production of new weapons and equipment. In accordance with the stated objectives, we *want* and *need* more organizations which are proficient in both development and production and whose management has the concept and experience of handling as a prime contractor the over-all job from the systems engineering point of view. We have some, but we want more industry organizations who can help to plan the whole job, who can integrate development and production to get a satisfactory and economical product, and who are experienced in taking care of such loose ends as manuals, training aids, spare parts and maintenance tools and practices. I know from my own experience that such prime contractors can help us to get on top of that most important "must" of reducing the time from initiation of a project to the availability of a satisfactory weapon in the hands of troops. As I have said already—this we have got to do—or else—the new equipment will be obsolescent when we get *it*. This we have got to do or else we shall lose the race.



The Day that Time Was Not for Sale

MAJOR PATRICK W. POWERS

It was a great race, although no one who saw it knew that it was to become a landmark in history. The tortoise was a slow starter but his deliberate, pokey gait never slackened; he was a plugger for sure. The smart bookmakers, who like to fix things so they are winners either way, took this into account in posting their odds. But they really didn't think the tortoise had a chance. Neither did the public, especially after the hare streaked around the first lap with a dazzling burst of speed. The crowd cheered madly and the hare, hearing it, began to play up to the multitude—he was really a ham at heart. He bowed at the applause, turned and bobbed his white tail at the pretty girls and clownishly feigned fatigue. He was such a ham that he sold himself and fell asleep. Meanwhile the tortoise slowly forged around and around the track. Aesop told the tale well, describing the agonizing awakening and futile attempt of the fleeter contestant to catch up. But the race was over all too soon. The tortoise, breathing easy, had sufficient lead to cross the finish line well ahead of the panting hare. Time was not for sale that day; *nothing in the whole wide world could ever change the outcome of that race.*

THE PROBLEM OF LEAD TIME

NO TIME FOR SALE

MAJOR PATRICK W. POWERS

THE United States and its allies are today in a race for survival. Just as in the race between the tortoise and the hare, it isn't the head start that is important. It's the lead that is maintained down the stretch to the finish line. In the uncertain timetable of events during the present period of tension we don't know *when* or *where* the finish line will appear, so it is particularly important that we keep in the lead all the way.

The most critical of the areas where our lead must be established is the military weapons field. The ability to implement national policy by military means still determines the odds set by international bookmakers, as it has for centuries past. One of our national objectives, then, in meeting the Communist threat, must be to produce superior weapons. Since we can't match the Communists' manpower, we are forced to turn to other areas to gain an advantage. This calls for the ability to give our military forces effective, operational weapons on a continuing basis if we are to counter the wide and shifting range of Soviet capabilities. To do this we must research, develop and produce weapons that will be phased in over future years to counter any new enemy weapons or equipment. The over-all period that it takes to complete this cycle is called weapons "lead time."

Lead time is defined as the period measured from the start of research and development until a weapon is in the hands of the using troops. You might say it is the period from wanting to getting, or "from womb to boom!" This period is measured in years and, consequently, the task requires long-range programming and detailed planning.

We are concerned not only with guns and missiles, but any means that enable a military force to arrive at its objective. These means include tanks, trucks, radios, supplies, electronics, and even special clothing.

Importance of lead time

Through the ages of warfare the useful period of "weapons life" has decreased as lead time increased with the complexity of the weapons system. During the early Christian era this life was about four hundred years. By the 1920s the period of usefulness had decreased to fifty. Today, some weapons live for only three to seven years.

On the other hand, our lead time for producing these weapons averages about eight or nine years. The lead time of some representative weapons now in use is shown on page 35. There are many reasons for the difference in time from research to issue of these weapons and related equipment. Some were naturally more complicated than others and required more research time. Others lacked a go-ahead decision during a particular phase of the program. Funding problems may have been encountered. Priorities of development may have differed. Some may have been carried through the entire cycle step by step while others had a telescoped lead time with concurrent research, development, testing, or production phases.

The average lead time of eight to nine years becomes more important when compared to that of the USSR. There are indications that the Soviets can produce weapons on a *five-year*-average time-scale. This means, of course, that beginning, say during 1958, the USSR can field an "average" weapon in 1963—three years before we can put the same one in the hands of troops in 1966 *(see chart, p. 36)*. This becomes even more serious when we realize that if we attempted to produce a counter-weapon to a known Soviet achievement, a three- or four-year period would transpire during which there might be very meager means, or none at all, with which to combat the enemy's new weapon. The tragic result: a continuous cycle of producing obsolescent or more nearly obsolete weapons in an age when technology is creating new weapons at an accelerated pace.

A race against time

This part of the weapons race—producing the counter-weapon—is very real to our air-defense planners. Since 1945 they have been racing against time and the Soviet weapons cycle. Nike Ajax was developed to meet the threat of the Soviet long-range bomber. How well it was conceived, developed, and produced is attested by the fact that Ajax is still effective against any known bomber. Nike Hercules was developed to extend the capabilities of Ajax. It also gives us a definite coverage, a tangible lead, in the future against Soviet manned or unmanned aircraft and air-to-surface missiles.

However, according to our weapons-life figure of three to seven years, Ajax, which became operational in 1953, may become less effective against any threats from the air after 1960. This is certainly true when the ballistic-missile threat is considered; for Ajax cannot cope with ballistic missiles, nor was it designed to do so.

So here is another example of the lead-time race

Major Patrick W. Powers, *Artillery,* was commissioned from West Point in 1945 and has been active in the missile field since 1950. He served as an instructor at the Antiaircraft and Guided Missiles Branch of The Artillery School (now the Air Defense School), and with one of the Army's first missile units. Since 1952 Major Powers, now on duty in the Office of the Army's Chief of Research and Development, has written several articles on missiles for *ARMY*.

for counter-weapons. In ballistic missiles we are behind the indicated Soviet lead in both a similar weapon and a counter-weapon. On the other hand, they probably are behind in the defensive-weapon field against our growing capability. Today we have no defense against their IRBM or ICBM. Their ballistic-missile capability was revealed in a startling manner when they launched Sputnik. The same booster rocket that placed the first earth satellite in orbit has the propulsion necessary to thrust a nuclear warhead 5,000 miles or more. Fortunately, we had already started the Nike Zeus program to counter the ICBM, but that missile will not be operational until early in the 1960-70 decade.

Organized for permanent conflict

Before going any further, let's more clearly define the Communist designs that make vital a strong military posture and newer, more radical weapons systems. The Soviet Union presents history's greatest triple threat: economic, political, and military.

Economically, the Soviets have increased their heavy-industry output where it is approaching ours. Recently their 1972 production goals were advanced to 1965. Since most of their heavy industry is geared to military products while ours is oriented toward consumer goods, their present military production approaches that of the Free World. Even on a wartime basis, it is entirely possible that their military production could still exceed ours. Many of us labor under the fallacy that because our standard of living is high compared with the USSR's, we will attain a production advantage in any emergency merely by shifting to wartime production. Not so. A nation must choose between a high standard of living or heavy military production. (Remember Hermann Goering's "guns instead of butter"?) It cannot afford both; Russia is devoting a larger proportion of its economy to military production, whereas we are devoting a larger portion of ours to consumer products. Can we afford to maintain this status? If we cannot, then it is possible we may shift too late.

Politically, the Communists have perpetuated a familiar pattern of fomenting unrest in underdeveloped areas: the Middle East, Africa, and Asia. Their sinister penetration into national governments is well known—even taken for granted. Their espionage has already caused immeasurable damage in our own country. By stealing our scientific and technological secrets, they have certainly pushed their weapons developments ahead of their own schedules.

It is the military threat that most vitally concerns us.

Remember, the Communist bloc has some 400 divisions, 500 submarines, and 25,000 combat aircraft. Their missile threat has been headlined through boasts by Kremlin leaders and emblazoned by 3,000 pounds of instrumented satellite. With eight million men under arms, Khrushchev need not explain his threat, "We will bury you!" Nor does Manuilski, their representative at the United Nations, elaborate on his early statement: "War to the hilt between Communism and Capitalism is inevitable. . . . As soon as their guard is down, we shall smash them with our clenched fist."

The Soviets are organized for permanent and continued conflict. They can attack the NATO forces in Europe and place our native soil under fire in a matter of hours. This, then, is the threat that faces us; the framework within which we must buy insurance for survival.

What must we know?

How can we meet the threat? If we consider only military weapons, it simply means we must produce better ones *before* the Soviets do. But first we must know the answers to several related problems. We must know our military requirement for future organizations and employment so that we can design the best weapons to support them. We must also know the enemy's capabilities projected over future years. Finally, we must be able to forecast advances in the arts of technology, of military science, and of production techniques to many years hence. If we can do that we can proceed to develop our own weapons and counter-weapons systems and put them in the hands of using troops in time to beat the Soviet's operational dates.

The future needs of flexible, national military forces that will meet all the conditions of cold war, so-called limited war, and total nuclear war are difficult to predict, judging from the Great Debate since Hiroshima. There are many gray areas in national policy and in the doctrines of the three services. The Army's approach to these requirements is based on the proposition that land forces are still the decisive factor in the various shades of war. We maintain that the combined application of mobility, dispersion, and control resulting from the Pentomic concept, supported by nuclear and nuclear-free firepower, will result in effective use of our combat forces. Consequently, weapons systems are being developed to fit this concept, to support these future units and their employment.

A correct estimate of Soviet future capabilities is difficult to obtain. The Iron Curtain has done a remark-

able job of concealing development progress. Often we learn of the existence of a weapon or other achievement only when the Soviets wish to display it. Sputnik's booster rocket must have been under development from the time the Russians captured the German V-2 rockets in 1945. From that time until 4 October 1957 was a lead time of twelve years—a considerable period these days for a weapons system. The art of rocketry was still in a primitive state after the war, so undoubtedly that remarkable project succeeded only after many failures.

Exploiting scientific breakthroughs

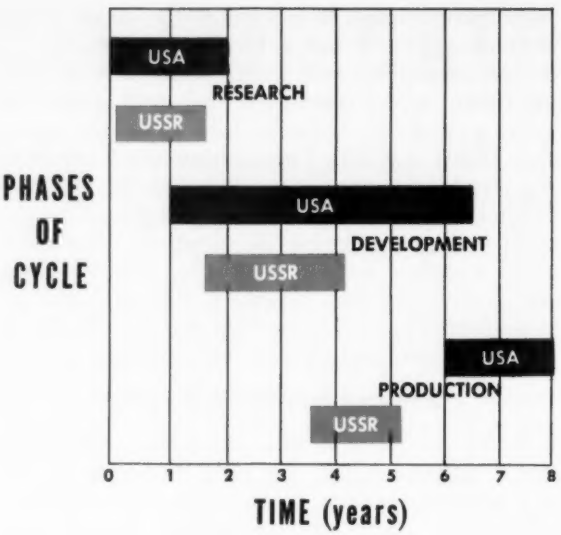
Obviously, there must be *some* other method of predicting future weapons threats than to wait for a potential enemy to display the finished product. The best way is to gauge possible weapons development against the predicted state of the art of technology, our own military capabilities, and industrial progress. In other words, a reasonable forecast of things to come with allowances for breakthroughs that might quickly revolutionize the weapons field and give our military capabilities a "quantum jump."

Suppose, for example, we perfect a usable "fuel cell" —one that converts a fuel directly to electrical energy at efficiencies approaching 100 per cent. This cell would resemble a storage battery with no electrolyte. We might combine free oxygen and hydrogen from outside the cell to produce electrical energy to power directly many types of propulsion systems. As a result, logistical requirements would drop, maintenance would be radically simplified, and the mobility of all types of ground and air vehicles would be multiplied. Think what this would do for our new tactical units on a widely dispersed battlefield!

Another type of breakthrough would be a practical "death ray"—that weapon so highly regarded by the mad scientist in the movies. Rays that will melt a brick at a distance of a few feet have been produced as far back as 1934 by the acceleration of sub-atomic particles. Certainly these machines are not fieldworthy, but the principle is there. The Army's solar furnace, recently placed in operation, can do the same kind of job. By concentrating the sun's rays it produces temperatures of 5,000 degrees Fahrenheit—enough to cut through a steel beam in about thirty seconds.

If either the Soviets or ourselves make such an advance in operational weapons, the other side must be ready with a counter-weapon. This is already the case with the development of Nike Zeus versus the ballistic missile. Such is the task of predicting enemy weapon capabilities over the years based on our own capabilities and the state of the art.

We must consider one more important factor in meeting the military threat that faces us. We must assume that an attack on any scale can be launched at any time and can reach our industrial and population centers within hours. Our military bases and forces would certainly be the primary targets, just as our



Pacific Fleet was on 7 December 1941. However, the USSR has the means—either by bombers, missiles, or widespread sabotage—to attack our national base before we could even start the traditional mobilization that has been our shield and source of strength in modern times.

Time is against us

Does this mean that time is against us? It certainly does. There may be no time for mobilization, no time to outproduce the Communists, no time to develop weapons or counter-weapons, no time to pour billions of dollars into the great surge of effort needed to bulwark the bastions of the Free World.

This is the darkest side of global war: to be caught completely off guard and for the greatest industrial complex in the world to be crippled. There are many reasons why the initial blows of any such conflict may never be so complete; that is, total disruption in a matter of hours. Our air-defense systems, the probability that anything moving through the atmosphere for 5,000 miles or so is bound to have operational difficulties, and the classic unknowns of war, all these reduce the likelihood of even reasonable success at first. However, as hours and days go by the degree of destruction will undoubtedly increase. We will find that the time it took to disrupt our national base is enormously disproportionate to the reaction time for rebuilding and for producing the weapons needed to recover our military losses.

It is obvious that in any serious international conflict with the Soviet bloc, events will move too fast for a change in production gears that will produce newer weapons at a faster rate. Time is the dimension for survival, and we must measure it carefully. Billions of dollars cannot buy time. If we believe that a weapons lead over the Soviets is vital, then that lead must be

substantial and *continuous*. It cannot be achieved quickly during a national emergency.

It might be well to point out that during the Korean War the appropriations for weapons made in 1950 and 1951 did not produce a significant expansion in deliveries until 1953 and 1954. And these were not the radically new or complex weapons we know today.

Let's restate our discussion: To meet the present and predicted Communist threat, we must have effective, operational weapons phased in over the years and backed by a sustained research and development effort. The way to insure this birth rate in weapons is to reduce the lead time that includes research, development, production and, finally, availability to the using troops. Reduced lead time also delays obsolescence during the short life-span of weapons usefulness. It is the only way to match and overtake the present weapons cycle of the USSR.

Lead time can be reduced

How can lead time be reduced? You could say by "crash programs," and you would be correct. But we can't afford to crash every weapons program. In fact, that is a difficulty today in developing some missiles. One set of priorities piles on another until objectives become garbled. Still, a brief examination of an accelerated weapons development program provides a good example of what can be done, and what should be attempted on a national scale.

The Jupiter IRBM is an appropriate model for reduced lead time. It had a three-year cycle. Of course it was a Presidential priority weapon, but the method of cutting five years off the average lead time is interesting to note.

Probably the two most significant factors are the management and the funding of the project. Authority to make decisions was decentralized, and authority to award contracts was delegated. In fact, contracts for some development phases were reduced to a simple letter and were processed in a week instead of months. Funding was simplified and justifications for spending reduced to an acceptable level. In current procedures, funding often goes through several reviews for justification at top levels. This one factor has caused sizable time delays in present weapons developments.

In the Jupiter program, production engineers were called in during the early phases of development so that the production base with industry could be implemented without delay. A training program and concept of field equipment began at this time. Designs reached the final stages early and engineering models of the missile and its equipment produced quickly. Initial firings used research, development, and even production components while the system's reliability was kept unusually high.

This telescoping or overlapping of the weapons cycle phases along with concurrent or combined testing is the key to any "hardware" development of our more complex weapons. This has been used with many Army missiles systems to reduce the lead time to five years and eight months—a substantial improvement, but not good enough. For our weapons a four-year lead-time cycle appears to be the proper goal. This is a vital national objective and it will take the combined efforts of industry, the services, and the government to achieve it.

No program of this magnitude will be easy to accomplish. It will require a combination of the better management and improved funding practices. It is a joint responsibility of industry and government (including the armed services). Industry's ability to mass-produce is the fundamental reason for our commercial greatness. Industry will continue to produce the complex weapons we need to meet the Communist threat. Government, in turn, must act as a catalyst and accelerate the entire weapons cycle if we are ever to obtain positive results.

We need national interest

A rather blunt question still needs to be answered. Do we have the national interest, courage, or objectives to create a lead in the weapons race? A former member of Congress called the arms race a "giant hoax"! Recently Vice Admiral Brown of the U. S. Navy said: "World War III has long since started. Whether we know it or not, we are fighting for our lives, and we are not doing it so well."

The views of many Americans may differ on the subject, but the important point is this: since the threat exists and our survival is at stake, are we doing everything we can to strengthen our national position? If the answer is "no," then we had better re-examine some of our fundamental beliefs and responsibilities.

Today, *it is clear that we cannot buy time*. Conversely, time will be against us in the future. Our alternative, then, is to use and budget, in the most effective manner, the time we have left to us.

Another reality, still shunned by millions of wishful thinkers, is that the free world is threatened by Communism's economic, political, and military goals. We must devise a long-range insurance program against this threat in each of its three dimensions. Such a program must first stress military production in order that the United States can maintain a strong national and international posture. To make effective, operational weapons available, we must reduce our lead time to a period of four years.

Aesop ended his fable about the tortoise and the hare with the moral: Slow and steady wins the race. Today, this might be paraphrased as "Lead time wins the weapons race." The threats of Communism have fashioned our national objectives in this weapons race. We know how to accomplish the task. We must establish our lead now—and keep it!

Manuals Are for Reading

Colonel Charles W. Gibbs

Too many manuals aren't read because they aren't readable. Here are some suggestions for improving our military literature

NO one doubts that the Army's literature has played a major role in making the American soldier the world's best informed. But what of the future? Today too many manuals remain unread and new on our library shelves year after year. We ought to find out why because sown there are the seeds of deterioration in our soldier's traditional high level of knowledge.

I suspect there are several reasons why our manuals are not being as widely read as they were, say, ten years ago. Some are rather obvious; others may be so obscure they would go unnoticed unless examined.

I propose to critically examine the broad aspects of Army literature from the viewpoint of a communicator, and to offer what I trust are constructive suggestions for improvement.

Time was when military know-how could be communicated to the soldier solely through the medium of the printed word. However, today's soldier faces fundamentally changed circumstances in the field of communications which seriously limit his chances of absorbing military knowledge. First of all, today's young recruit is a product of a family environment in which reading for recreation is rapidly falling off. The habit of reading books, whether for entertainment or learning, is being displaced by the television show. Although the full impact of television has not been analyzed, certainly our young man direct from his home surroundings enters the Army with habits which markedly reduce his ability to absorb what he will be taught in his new environment.

Too much in too many books

For our purposes, let's assume that the young recruit

Colonel Charles W. Gibbs, *Signal Corps,* whose specialty is military communications, is Signal Officer of the Air Defense Center at Fort Bliss. Beginning as a signal company enlisted man in 1934, he has been concerned with infantry division communications ever since. During World War II he served with the 63d Infantry Division in ETO. Since then he has served in communications operations on the staffs of corps, armies and theaters, as well as on the Army Signal Board. Colonel Gibbs wrote "Pentomic Age Telephony" in our May 1958 issue.

has overcome his disinclination for learning by reading, and marches to the nearest military textbook shelf. He is smart enough to seek out the index volume to our field and technical manuals. On page 65 he finds "Individual Soldier: Camouflage, FM 5-20A." Most of the subtitles under "Individual Soldier" indicate that each book would be likely to contain information about which he knows little or nothing. So the field for learning is unlimited—if he is willing to read. For example, if he wants to learn about Rules of Land Warfare, there is FM 27-10 (Basic Rules And Principles of Land Warfare). What he finds here makes him look again at the title.

On the subject of Explosives there is FM 9-40 (Hazardous Effect), FM 5-25 (Handling), and FM 5-31 (Booby Traps). Still scanning the index, his eye catches on FM 21-13 (Soldier's Guide). It took him several days to find a copy of it—in the post library. (He thereby learned an old Army fact of life: the manual you need is rarely on the bookshelf.)

Now this lad had studied American History I and II and Civics and Geography in high school. He knew from experience to consult a math textbook for math formulas and a history book for events. So he was only slightly confused when he opened this soldier's basic handbook and found it started not with anything about the individual soldier but (in the good old staff-study tradition) with history! Having learned his math well in school he made some rapid calculations (using only listings in the index, mind you) and estimated that if a child began reading FMs and TMs at the age of seven and if he read every day of his life, he would be 108 years old when he finished them all. Of course he would never have time to *practice* what the manuals taught him.

The fact is that we have too much printed information on too many pages in too many books for anyone to get much out of them.

Even after several years of service and the benefit of several directed reading programs (whose FM references were figured out by some dedicated trained officer or faculty member) it is still difficult for a soldier to determine exactly which manual has the information he seeks. The safest bet is to get several manuals whose titles mention the subject in any way. Even then he runs the chance that what he seeks may be in a technical manual or in an FM or other publication whose title does not suggest it.

Over the years as the Army increased in size and complexity, our manuals were amended and new ones published to treat of different phases of military doctrine. In general, they were written around the techniques of the several branches of the service.

This arrangement of literature worked well so long as there were only two or three basic combat arms. While the infantry had simple rifles and the artillery's weapons were confined to one basic type, the Army's technical publications were simple and few.

Of course, as weapons became more complex the branches tended to organize around each new weapon or other piece of hardware (they still do, for that matter). More branches arose, each with its own set of publications.

Once we had only one kind of infantry. Motorized infantry, armored infantry, and airborne infantry followed.

Similarly, the artillery branch splintered into several. Field artillery, besides organizing according to the caliber of its weapons (75mm gun battalions, 105mm howitzer battalions, and so on), was further divided into horse-drawn, truck-drawn, tractor-drawn and self-propelled. Add to these mountain or mule pack artillery, armored artillery and airborne. Coast artillery and antiaircraft artillery accounted for more major groupings, each with its own set of publications and each tending to organize around new weapons, including today's missiles. (The current "weapons system" approach to missiles may in time swing the pendulum the other way.)

While this went on, the technical services and other branches with support-type missions were forming subactivities or otherwise reorganizing to support the many splinter groups of the basic arms. These support branches also inclined toward organizing around their equipment and to write series of publications keyed to each new piece of hardware acquired by the combat arms. This practice sometimes created unusual combinations, resulting in branches branching out into entirely new fields of activity. Just recently the quartermasters unveiled a new missile, Lobber. You can bet we will see Lobber manuals—how to use them for hauling cargo, others on handling and storing, still other manuals on how to repair them.

All this fragmentation (no criticism intended, because each instance really represented progress toward a better and harder-hitting Army) has resulted in a maze of literature that is outmoded in its present form and packaging. It is simply not being read. True, students at service schools can be *required* to read a certain few of the myriad of publications, but no one man can more than scratch the surface. Remember that the average young soldier is not in the habit of reading anything which requires concentration for any length of time.

The quality is spotty

Though what I have to say is, I trust, constructively critical, there are some bright spots in our literature program. Many dedicated men have made valiant attempts to keep pace with the soldier's changing reading habits. Here and there some manuals have been "modernized." Some technical manual revisions use the "comic book" approach to capture reader interest. It can be argued that such a presentation lowers the dignity of textbooks that are intended for serious study. On the other hand, the dignified but "dry" ones are not read. So the comic-book advocates argue that it is better

(Continued on page 42)

The four-ton H-16, first in Vertol's series of turbine-powered helicopters, flown in 1955.

The H-21D research aircraft equipped with two GE T-58 turbo-shaft engines, flown in 1957.

The Vertol 105 with two Lycoming T-53 engines used in the test programs, flown in 1957.

Why Vertol leads in turbine helicopter design and development

Steady progress in helicopter technology has advanced this versatile air vehicle to the threshold of a new era of usefulness. It is the era of the turbine-powered transport helicopter designed for improved battlefield mobility and logistical support of combat elements and missile systems, and for all-weather, day-night operations.

Vertol has been and is today at the forefront in progress toward this new achievement. Among the first to recognize that turbine power would vastly improve performance, capacity and versatility, Vertol also is a leader in research and development on new designs incorporating these powerplants.

The result of many years of work in this field is the Vertol 107, first member of an entirely new generation of multi-turbine helicopters destined to play vital roles in short-range transportation throughout the world. Now in production for the U.S. Army, the 107 can be adapted to an almost limitless variety of functions without altering basic design. Its growth potentialities are built in, assuring a steady progression of helicopters with even greater performance, load-carrying ability and versatility. Detailed engineering on growth versions of the 107, which will incorporate more advanced engines now in development, is under way.

In 1958 the Vertol 76, powered by the Lycoming T-53 was the world's first successful tilt-wing VTOL.

VERTOL Aircraft Corporation

MORTON, PENNSYLVANIA

SUBSIDIARY, ALLIED RESEARCH ASSOCIATES, INC., BOSTON, MASS

(Continued from page 39)

to have a book whose dignity is slightly lowered, but which gets read, than to have a highly dignified textbook (with no cartoons) which remains on the shelf. There is good logic all around.

FM 21-13, which we used as the example, is one of the better manuals on our shelves today. It is a step toward reestablishing communication with the modern soldier. Though some of its chapters leave a lot to be desired, its comparatively short chapters in general are very readable.

The illustrations on pages 47 and 82, however, are examples of how *not* to communicate! Backward psychology is evident throughout the book. On page 47, in the illustration of rank, the insignia starts with a five-star general and works *down* to the private soldier. The PFC insignia is at the *bottom* on page 49! By this time the recruit's ego has been so shattered that he feels he can crawl under a worm.

At the top of page 82 is what purports to show "How you fit in." The individual soldier is shown, alone, as a big fellow with broad shoulders, over the label *this is you!* In the second line, he is a little smaller as a member of a squad, on the third line still smaller in his platoon, and so on *down*. By the time he reaches the bottom of the page he is represented in the battalion by an infinitesimal dot. Now no one wants to be just a *dot!*

Some short, well-written paragraphs of sure-fire interest to the new soldier are tucked away over on page 157 of his guide book and appear in the order: sports, dayroom, service club, library, hobby shop, post movies, PX and guest house. By the time he gets to page 157 he has probably been to all of these, and come away with the telephone numbers of the better-looking hostesses.

Planners of any undertaking so vast as a major reorganization and modernization of the Army's literature must carefully weigh many complex factors. Though drastic changes are needed, they should not be made in haste. Nor should we rush out and let a blue-sky contract to a publisher for revising our literature at a fantastic fee. The general publisher knows little about the Army. He must acquire the viewpoint of the soldier before starting to edit.

To consolidate several manuals into one would make fewer, but thicker, manuals. The straight comic-book presentation is not the answer either.

Basic basic manuals

What can we do to make our military literature at once more palatable to the young soldier, yet more compatible with the tempo and complexity of the modern Army and preserving those ageless fundamentals called doctrine?

It would be highly presumptuous to try to answer the question here. The best we can do is to offer certain suggestions. If the proposals presented here are examined by those in charge of producing our training literature, there is a chance that they may point the way toward needed improvements. The revisions we need deserve the best constructive thinking of the whole Army. We must aim at reestablishing, strengthening and improving our methods of communicating to the real power of the Army—the soldier. These revisions must not be delayed.

Most important, because it is the basis for all instructional literature, is doctrine. Not infantry, artillery or signal doctrine, but overall *Army* doctrine which spells out the fundamental tenets of the basic science of land combat. To us, this should be equivalent to the laws of Moses, and should be in one thin manual clearly labeled ARMY DOCTRINE.

A small group of sub-manuals could go into more specialized doctrine. There would be one on, say, Basic Firepower Doctrine (regardless of whether the infantry, armor or artillery were delivering the fire). Another would cover the fundamentals of Army Mobility. Still another might deal with Command Control Communications Doctrine. (This would explain fundamental principles and would be aimed at whoever was to do the communicating.)

Next, to follow the doctrine series could come the technique manuals. Their texts would be fundamental and therefore have only a few pages based on the appropriate doctrine. They might bear titles like Technique of Fire. (Small arms, artillery, missiles, all must employ basic techniques of fire. This book would describe all.) Others might be Techniques of Control, Movement Techniques, Security Techniques, and so on. They would derive from the doctrine manuals and merely be an expansion of the basic tenets into the techniques series, to tell *how*.

At about here the "branch" manuals (if any) should enter the line. These should deal only with doctrinal matters which are and must remain unique to that par-

ticular branch in order for the *whole* Army to operate! (Here is where some duplication in our present literature might be eliminated.) Let's rid our manuals of rigidly drawn jurisdictional lines and get simple information in them.

Better technical manuals

A few words about technical manuals. All radios and radars have antennas. Why not *one* book on antennas? Almost everything that uses electricity is powered in the field by an engine-driven power unit. Let's have one book on power units. (The Engineers, the Signal Corps and the Ford Motor Company can contribute data on their power units if they must; but include all of these in *one* book.)

Technical manuals should cover major areas of hardware. Loose-leaf binders facilitate the insertion of revisions and additions, modification work orders, lubrication instructions and the like. They could be inserted near the pages that describe basic equipment.

Tailor the book to the soldier

The "handbook" format lends itself to covering many subjects of interest in short "bursts" which are easy to absorb. FM 21-13 is well arranged in this regard and should form the pattern for combining several of our existing series.

The length of all manuals should be drastically reduced. This can be done by expert condensing that includes only the essentials.

To be more specific, FM writers should avoid being as long-winded as this article. At the same time they should avoid the cryptic style of the school boy who delivered this essay:

Frogs

What a wonderful bird the frog are
When he sit, he stand—almost
When he hop, he fly—almost
He ain't got no sense hardly
He ain't got no tail hardly neither
When he sit, he sit on what he ain't got—almost.

The boy's description touches on everything from stance and mental capacity to overall configuration and locomotion. Yet it would not serve as instructional prose for our purposes.

Finally, our current literature should be critically reviewed with an eye to graphics, format, and readability. We should not hesitate to use the gimmicks of Madison Avenue plus the products of our own best brains to get the message across. While avoiding corny cartoons which lower the dignity of the message, we can use catchy sketches wherever they will shorten and pep up a dry subject.

Today's soldier will and *can* read a military textbook if it is made interesting enough. But we must keep his basic reading habits in mind. He simply won't read if we break down communication with him.

If we do not bring our literature up to date (some manuals are early 1940 editions) and modernize the presentation; if we don't reduce the number drastically, our training literature might become the barrage that cuts our vital communications with the soldier.

The seeds of victory or defeat are sown *between* wars! Military publications are the primary source of training information available to the inexperienced during peacetime. We can afford nothing less than the best-informed soldiers in the world!

MIXTURE FOR MOBILITY

Air and ground vehicles for the Army

COLONEL GEORGE P. SENEFF, JR.

THE United States Army is a long way from achieving the degree of mobility that General Gavin foresaw when he said: "My thoughts on 'skycav' were that in the ultimate we should seek a force that would be able to cut a swath 500 miles wide from the Black Sea to the Baltic, leaving complete destruction behind it, without ever setting foot on the ground." However, its beginnings are within our grasp today. If we can stir ourselves to energy, thought and leadership, General Gavin's ultimate is not too far distant.

Colonel George P. Seneff, Jr., *Armor,* graduated from West Point in 1941 and spent the war years with several armored divisions here and in ETO. His flight training during 1955-56 qualifies him in both fixed- and rotary-wing aircraft. Since then he has been on duty in the Air Mobility Division of the Office of the Chief of Research and Development.

Throughout history, superior mobility has always been the answer to overwhelming forces. It is important to realize that the mobility we are talking about, while it depends largely upon equipment, is possible only if commanders have the breadth of vision to instill in their troops the desire to be mobile.

Napoleon's superior skill in rapidly moving small bodies of troops enabled him to defeat the much larger forces that faced him in his Italian campaigns. But when he achieved the level of ruler and had the largest and most ponderous armies in Europe—mostly untrained conscripts who could be launched in a given direction but not moved to suit the mobile mind of their commander—he was defeated by the superior tactical and strategic mobility of the British. The tactical end of it came from the British light infantry whose differential in mobility lay in the fact that they were trained to operate as individuals, and had been

My thoughts on Sky Cav were that in the ultimate we should seek a force that would be able to cut a swath 500 miles wide from the Black Sea to the Baltic, leaving complete destruction behind it, without ever setting foot on the ground.

LT. GEN. JAMES M. GAVIN

taught to march at 140 steps a minute against the French 110. The superior strategic mobility of the British came in the form of seapower which made them able to ring in the French and place British troops any place on the Continent.

During the early days of World War II the Germans made effective use of armor, combined with mobile firepower from the air, to break some of the most massive defensive works of all time. They in turn were done in when they lost their ability to move in the mud and ice of Russia, when their means of movement were destroyed by Allied air power, and because on the Western front the differential in mobility had shifted to the other side.

Finally and most recently, we have seen the fighting forces of the most productive nation in the world grind to a halt in Korea on many occasions, because their mobility, being understood only in terms of road networks, could not equal the celerity of their opponents across the rice paddies and ridge lines.

What faces us today?

Consider what faces the U. S. Army today in either general or limited war. First, we face overwhelming masses of people. Second, we will have to overcome some of the most difficult of the world's terrain obstacles, whether in Central Europe, the Middle East or the Far East. Third, we must operate in the knowledge that any war, small or large, can become nuclear in nature with little or no warning. Finally, we must be able to fight over distances that are vast in the strategic sense. In the face of these facts it is unthinkable that we could consider maintaining or building an army whose operational capabilities match only those of its World War II predecessor.

Even though we are attempting to solve the problems these factors thrust upon us with concepts of "dispersion between units," "superior ground mobility," "Mass systems of logistics" and the like; and even if the aim of these catch phrases were achievable, they are still part and parcel of a ponderous setup. This setup can only bring to mind great masses of men and their mountains of equipment, continuous fronts stretching hundreds of miles; overwhelmingly long and choked supply lines, subject to the dangers of submarine, surface and air attacks; tremendous stores of supplies in rear areas; and so on. All these on top of the painful, slow, expensive, gruelling slugging match of pushing the enemy back over a whole continent until he is too weak to pursue a war further.

The ideal we must achieve

The ideal of the United States Army should be the creation of a lightweight, fast-moving, hard-striking force able to go any place in the world at a moment's notice. By that I mean we should be able to deploy any place in the Middle East, the Far East, the heartland of Siberia, or wherever it may be required, within hours, not days. The Army should be composed of comparatively small units of highly skilled soldiers who are trained to a razor's edge, who can fight individually, and whose personal and unit equipment makes them completely mobile. They must have the most advanced firepower systems and communications equipment our technology can give them. It is almost axiomatic that the mobility of this force must come through the air. No other medium of movement can do the job. We should not envision the next war as a shoulder-to-shoulder slugging match. Future equipment will make it possible to carry the battle directly to the enemy's ICBM site, his capital or his major command posts, his supply depots or other critical areas whose loss will make it impossible for him to have "fronts" himself.

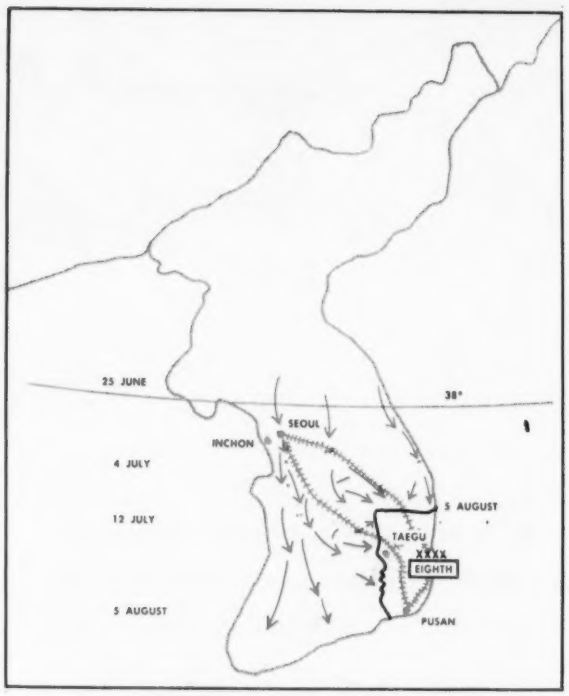


FIGURE 1. The North Korean sweep during the first six weeks

The Army is beginning to pursue this ideal today, but its progress is slow. Because it is slow, the day when it could reach fruition is being delayed correspondingly.

Let us consider what we could be doing right now to build forces that would lead us in this direction. We can examine a few examples to see what forces of this type might do for us.

We have the gear

In the United States Army today we have the equipment which would enable us to develop forces having complete tactical air mobility. These are the aircraft, particularly helicopters, that have been in our inventory for some time. We can skip tables of organization, exact means of employment, and even precise types of forces. We need only to say that we would require artillery, missile, infantry and reconnaissance units, all of which are completely air mobile. For a start, we could make

artillery, missile and infantry units air-mobile largely by merging existing type line units with pooled cargo helicopters and fixed-wing aircraft. These aircraft would be used for transport only. In order to do their jobs on the ground the units would deploy in their somewhat normal fashion.

The reconnaissance units would be somewhat different. Like our existing units, they would operate and fight largely from their vehicles. They would have a properly balanced mixture of armed reconnaissance scout helicopters, surveillance aircraft, helicopter transported riflemen to give the force a limited ground-holding capability, and helicopter-borne fire support—in the form of rocket- and missile-carrying aircraft. The whole would have to be backed by a relatively short-range properly balanced air logistical fleet.

The tactics of such forces would be precisely those of today, but they would fight over wider areas and with greater freedom of movement. Aerial vehicles would lift the Army's fleet out of the mud—to enable us to break away from the accidents of terrain and overcome the obstacles that armies have encountered from time immemorial. At the same time, by flying within the nap of the earth so as to use ridge lines, ravines, wood lines, and other terrain features for cover and concealment, our aerial forces would get the same cover from the terrain that has always made the ground the soldier's best friend. These forces would use fire-and-movement in the same fashion as any small force working its way across a piece of terrain during conventional employment.

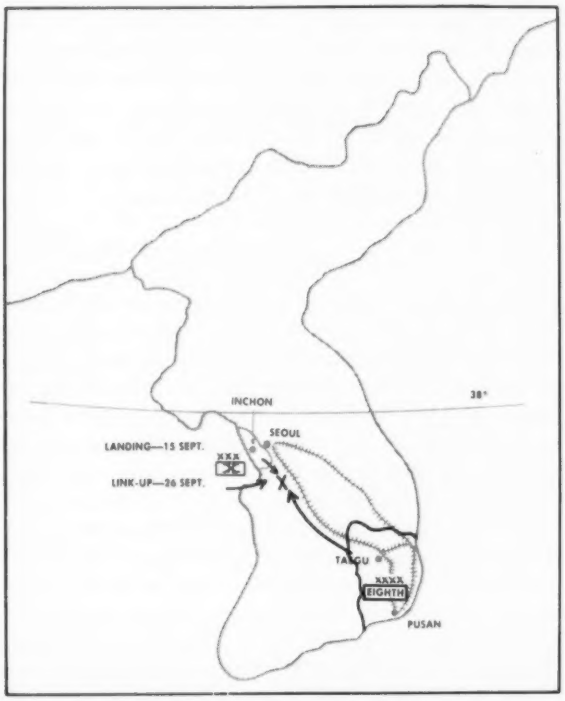


FIGURE 2. The 11-day link up between Inchon landing and Pusan perimeter forces

How would we use such a force?

It has always been one of the more popular of the soldier's pastimes to consider how he would have fought yesterday's war with tomorrow's weapons. For our purposes this is not really necessary. At the beginning of the Korean War we had many of the types of aircraft that we have in our inventory today. Had we also had the concept, and the will to pursue that concept, we might have been able to fight it quite differently—at least certain phases of it.

Recall the plight of the United States—the nation that should have had the most advanced army in the world—when the North Koreans crossed the 38th parallel in June 1950. The first force we could get into the line was Task Force Smith. This was some five days later, after the decision had been made to employ ground troops. This force, numbering some four hundred men (a company-plus of infantry, a battery of artillery, and spare parts), was flown to Pusan, put on the railroads headed north, and told to find the enemy and delay him.

Think of the odds against this small group! These soldiers knew they faced forces that were measured in divisions. Their ability to move over rugged terrain was nil. They had poor communications and the barest of firepower. TF Smith did the only thing it could do. It went as far north as it could by rail and then set up a position on a hilltop south of Seoul. Here these men had to sit and wait, rooted to the ground they were to die on. They could not know their enemy; what sort of equipment he had, where he would come from, nor when. Nor did they have any means of moving so as to counter him or effectively carry on their delaying mission. Their first real knowledge of their enemy came when his tanks loomed out of the morning mists on the 5th of July and quickly rolled through their position.

The means of mobility—unused

This pattern was repeated many times as additional forces were thrown in, from the time TF Smith's position was hit to the establishment of the Pusan Perimeter: a battering penetration, an encircling movement around one or both flanks, roads cut off from the rear, and pitiful handfuls of American soldiers straggling out, sometimes with only personal equipment, but more often unable to carry even that.

Following this pattern, the series of enemy advances through the succeeding 30 days, shown in *Figure 1*, quickly took care of Smith's force, then the first element of battalion size that went in behind him, then the first regiment that followed, and finally two more. The enemy drive was not ultimately stopped until we had three divisions in position along the Pusan line. It is doubtful whether a force as poorly organized as the North Koreans could have covered this distance much faster, even against no opposition.

This period cost the United States 6,000 casualties, and quantities of equipment that have not been esti-

mated. The main reason for these high losses, aside from our general state of unreadiness, was the complete lack of mobility on the part of our troops. Yet the means of achieving the degree of mobility required existed at that time. Almost every helicopter we have today was on hand before 1950, although few of them were in the Army's possession. Think what a difference it might have made if in 1950 we had had, poised in Japan, its foot on the starting block, a regimental sized or even battalion sized helicopter-borne reconnaissance unit backed up by a couple of infantry regiments trained in helicopter-borne operations, with the equipment necessary to transport them. With suitable ferrying arrangements, a force of this kind could have been flown from Japan into direct contact with the enemy. The reconnaissance elements would have had the communications they needed. They could have carried their own firepower and demolitions to do a very effective delaying job. Most important of all, they would have been able to land any place they desired in Korea, there to exploit to the maximum their ability to delay. They could not have been outflanked. They would have been protected against being cut off from the rear. Such a force could have maintained constant contact with the enemy, and in general could have brought our technological capability to bear to give their small numbers a tremendous advantage over the hordes that faced them. The lightweight back-up regiments would have had the same capability of moving to where they could do the most good. I contend that such forces could have delayed the North Koreans more effectively and certainly with far less loss of life and equipment than the operation cost us.

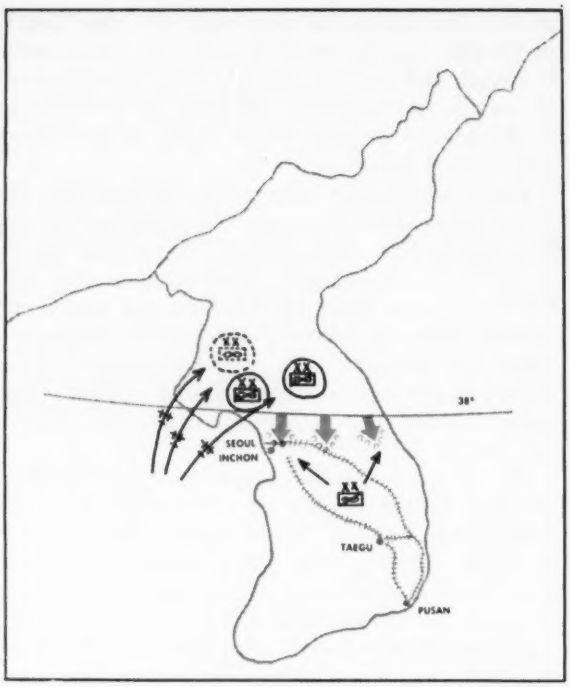


FIGURE 3. How it could have been done had we had air mobility

Inchon could have been easier

There was a second instance when this type of air-mobile force might have paid great dividends. This was at the time of the Inchon landings (*Figure* 2). The forces that landed at Inchon took 11 days to link up with those moving up from the Pusan Perimeter. During the course of these 11 days, a large proportion of the North Koreans below the line of the link-up had escaped. An air-mobile task force launched from carriers and other ships off the coast, could have straddled the rail line to effect the link-up much more quickly. The first elements in—again, the reconnaissance forces—followed up quickly by infantry in sufficient numbers and in succeeding waves, if necessary, could have sealed off the enemy to the south in a day or two at most.

The third instance is the Christmas advance to the Yalu and our subsequent withdrawal. When our forces began the November push that was to be the final great move to the Yalu, they did not know until their own attack had jumped off that they were to run abruptly and sadly into twenty-odd Chinese divisions that had crossed the Yalu during the preceding few days. In fact, the Chinese Communists were launching their own offensive to the south at the same time.

The next few days can be described only as some of the sorriest in American history, largely because of our appalling inability to move in the face of overwhelming numbers. It requires little to bring back memories of road-bound elements being shot up from the ridge lines, of cut-off elements unable to break out, or of our lack of knowledge of the enemy. Again, had we had a measure of air-mobile forces, we would have had a much better chance. In the first place, we would have learned that the Chinese were there. Secondly, we could have maintained screens to keep the Chinese on the ridge lines off our backs, and to extricate forces which had been surrounded or cut off. It could have made a very great difference in terms of people lost.

It has been done before

Finally, how might we have fought the Korean War had we had forces of this kind developed to a really superior degree? For example, suppose we had had three or four air-mobile divisions with the necessary back-up and equipment in Japan instead of the infantry forces we did have? *Figure* 3 illustrates a different and potential type of campaign. One division-sized force might have been thrown in to the south to delay and contain while two or three similar divisions in the enemy's backyard would "fight him where he ain't" and do him the most harm. These forces would have had to be continuously on the move, striking and destroying in one area, advancing quickly to do the same in another. Elusiveness would have been their chief characteristic. They would have had to operate without fixed bases, being supplied by airdrop in daily-changed resupply

areas, consolidating periodically to lick their wounds and get ready for the next foray, moving out before being seriously hit. They would have been able to move continuously over the terrain, and to re-strike points once destroyed as soon as the enemy repaired them.

The operation and maintenance of such forces is by no means inconceivable. It has been done many times in the past. It simply remains for us to tie our ingenuity and what we've learned in the past to the new gear that will make such operations once again possible. In an action like Korea, with the right kind of leadership in sufficiently trained forces, it might have been possible in very short order to destroy the enemy's ability to carry the war. The long, costly, bloody exercise that was Korea might thus have never transpired.

Aside from Korea, we can also draw on other limited engagements that have faced various of our allies. The French in Algeria went far toward developing the type of air-mobile force we are talking about. With them they put down raiding bands that could be reached through no other means. In Kenya the British would have found an air-mobile force invaluable and much more able to do the job over the dispersed areas where they had to contend with the Mau-Mau. As a most recent example, had we had a balanced air-mobile force of this kind in the Middle East, when the Lebanon crisis developed, we could have put it on the scene in an orderly fashion. It would have been ready to cope with the difficult terrain of the hinterland in a day instead of going through the agonizing problems of aerial delivery—while tied to airfields and roads.

I do not advocate eliminating conventional forces at this stage of the game. Any transition must be gradual. In the meantime we must maintain our ability to fight "conventional" general war.

Use with "conventional" forces

Let's see how forces of this kind might be used in conjunction with conventional forces in a general war. There can be little doubt that air-mobile forces, using sound tactics that include supporting strikes by the Air Force, artillery and missiles, and so on, could have done a much more effective job than did the airborne divisions which were landed in Normandy. Such forces could have more effectively screened the south flank of the Third Army as it raced across France toward Paris and the Rhine. Remember that we tried to do just that with IX Tactical Air Force. But I must point out that there is a tremendous difference, during such operations, between the "staying power" of Army air-mobile forces and the capabilities of the Air Force as we knew them then or know them today. Air-mobile forces would have been a tremendous boon to the Germans with their wide-open flanks on the steppes of Russia. The Rhine crossings and the final days of World War II are other obvious instances when such forces would have been worth their weight in gold.

The U. S. Army is able to build such forces today, yet progress is slow and faces much opposition. We face the arguments that the expense is too great; that helicopters are too vulnerable; that resupply difficulties are too great to be overcome; that the quantities of fuel such a force would consume are beyond our ability to supply by air. All these difficulties are recognized as being strong props in support of objections, but the very difficulties themselves present the need to get cracking. Certainly the equipment, is expensive. But if smaller numbers of men, with less equipment, can do a mightier job than our existing forces can, then that is the direction in which we must go. The difficulties in aerial resupply and fuel consumption are indeed great—all the more reason for placing the effort on the search for breakthroughs in the propulsion means. We must also press the development of equipment that will do a better job than our present limited-performance helicopters and fixed-wing aircraft.

We need thinkers

Promising developments in the equipment field are coming along. In our efforts to acquire equipments that will make air-mobile forces truly possible, we are pushing the development of an aerial vehicle and other means of aerial movement which show even greater promise. It is even probable that we will be able to come up with devices whose long-range mobility will give them strategic freedom—the ability to carry out strategic movements without having to depend upon conventional airlift, and into areas where no airfields exist. But we must put much more effort into this effort than we are doing now. The vulnerability of aircraft is indeed a worry. But are they as vulnerable as the doughboy on the ground, or the reconnaissance trooper in his vehicle? Aerial vehicles, operating in the nap of the earth, offer a small and fleeting target, and can move speedily in any of three directions.

What is needed most of all is thinkers—and a willingness on the part of everyone in the Army to receive, adapt and try their ideas. We must be willing to drop large blocks of manpower in favor of developing a lightweight, fast-moving, hard-striking Army that will enable us to carry the war to the enemy's missile sites, his capital, his sources of supply—even into his backyard.

It may be charged that this is partly the thesis of Douhet and Seversky and the other proponents of Victory Through Airpower. I'll admit it is similar to the thesis on which the Air Force has risen to its present stature. I must point out, however, that there is tremendous difference between the ability to deliver bombs from on high and the ability to control the ground by close-in fighting and, in effect, to project an American infantryman into an enemy mayor's office. If the U. S. Army is to capitalize on its limited-yield atomic weapons and the other outstanding systems of firepower and communications now within our grasp, we must adopt as our primary slogan, "Get Mobile." We cannot do it so long as we retain our nostalgia for the mud.

The Security of the Nation

(Continued from page 26)

they have failed to examine the product of cheapness. And even among Americans who understand this, there are many who have pushed this aside and out of sight because they were told that this kind of military security was too costly in dollars.

The Costs of Declining Strength

DURING 1952-53, one of the declared objectives of our Government was the leveling off of the peaks and valleys of security spending to a plateau that would provide adequate national security without the exorbitant costs of crash programs.

Since then, the strength of the active Army has decreased 43 per cent. Whatever the plateau of active Army strength may ideally be, it has not been so fixed as to become a discernible landmark. For a time, during 1956-57, the plateau appeared to be 1,000,025, but in the summer and fall of 1957 a flash flood, ordered by the Administration, lowered the plateau of Army strength to slightly more than 900,000 by June 1958. The washout of another 30,000 is in full flood. By 30 June next, the strength of the Army will be 870,000—an erosion of 664,000 in six years.

All this transpired during a period that saw the Hungary uprising, the Suez fiasco, the Israel-Egyption war, unrest in the Middle East that finally resulted in the dispatch of U. S. forces to Lebanon and British forces to Jordan, the belligerence of Communist China over the offshore islands, the successful launchings of the Soviet earth satellites, and the uncontested evidence of the Moscow parade in November 1957 that Soviet weapons are in many ways more advanced than our own.

During the same period there were no comparable reductions in Communist land forces. Dr. Raymond L. Garthoff, perhaps the leading Western authority on Soviet military affairs, has stated that he doubts if announced reductions in Soviet land forces were ever carried out.

The proper plateau of U. S. Army strength in these perilous times, is clearly more than 870,000. This figure will not only reduce the active Army to 14 divisions (compared to 28 six years ago); it will assure us combat units at less than full strength and combat units engaged in training and housekeeping activities that do not advance a state of battle readiness.

The present condition of STRAC's major combat units typifies this. Of STRAC's four combat divisions (to become three soon), only one—the 101st Airborne—is at full strength and presumably ready for action.

Even with the best will in the world, it is impossible during a time of manpower reductions for the Army to keep 10 (seven overseas plus three in STRAC) of its 14 combat divisions at full strength. In addition to necessary manpower levies that reduce strength, units are called upon to depart from their training for battle and conduct basic training for draftees assigned without prior training.

To the Army this is an old and unpalatable story. It was what happened between 1946 and 1950 and many times before. When Army commitments, based on national objectives, are too large for the available resources, the strains and stresses are felt throughout the entire establishment, weakening all units, leaving none at a full combat potential. As every experienced military man knows, there is a point of diminishing returns, and given the missions of today's Army and the threat it faces, a strength of fewer than a million men is well beyond that point.

One year ago, in his State of the Union message, President Eisenhower stated that "military power serves the cause of security by making prohibitive the cost of any aggressive attack." The reverse of this is also true: security is ill-served when defended by inaedquate military power.

Million-Man Active Army

IT IS THE POSITION of the Association of the United States Army that the Nation's security is ill-served when the strength of the active Army drops below one million officers and men.

This could provide a force of 17 combat divisions, plus necessary separate battle groups and combat commands, surface-to-surface missile battalions and surface-to-air air-defense battalions.

By any calculation, a million-man Army is a conservative force, and to hold it at that strength involves some risks. Lieutenant General James M. Gavin has said that an Army of 28 divisions would not be unrealistic. This indicates the conservative nature of the million-man proposal.

Army Reserve and National Guard

IN EVERY WAR the nation has fought it has been necessary to mobilize citizen soldiers, train and equip them for battle—after the conflict began. Two things have so far saved us from early disaster: the protective moats of the two oceans and the time to mobilize partially trained and equipped units of the National Guard and Army Reserve. Today no reasonable person could believe that we would ever again be given the time to mobilize, equip and train forces needed for early reinforcement of the active Army. For this reason strong, trained and modernly armed reserve forces are essential. These forces must include units ticketed for early commitment to the theater of operations.

This requirement has been recognized since the end of the Second World War. And in 1955 the Administration vigorously and successfully advocated legislation that resulted in the Reserve Forces Act (known as RFA 55) which provided for six-months of active training for draft-age volunteers who would then join a reserve organization for several years. The program also imposed a reserve obligation on two-year draftees. The object of this legislation was the revitalization of reserve forces; it would, it was maintained, provide insurance that would permit the active Army to be reduced from the Korean War strength of about 1.5 millions.

The logic of the insurance plan rested, of course, on the build-up of the Army Reserve and Army National Guard with six-month trainees and two-year draftees. Many men were and are being trained under the six-month program although not in the numbers projected in 1955. Even so, the Administration's reduction of the strength of the reserve components makes it impossible to enroll in a reserve unit all two-year draftees after they complete their active service. Consequently, the face value of the reserve as insurance has been seriously devalued, and the proper balance between the active Army and the reserve forces has been impaired to the detriment of both.

In an effort to retain at least some semblance of balance the Congress last year decreed, over the protests of the Administration, that the Army National Guard should not go below 400,000 and the Army Reserve below 300,000. The Administration wanted the strengths to be 360,000 and 270,000 respectively. This year the Administration has again proposed reducing the reserves to these strengths.

The inescapable conclusion of this is that the historic principle, validated by military necessity, of strengthening the reserves when the active Army is reduced in strength is no longer recognized, although it was actively endorsed by the present Administration as recently as 1955.

It is the position of the Association of the U. S. Army that such a balance should be maintained. For this reason the Association of the U. S. Army advocates "a paid drill strength of not less than 400,000 in the Army National Guard, and not less than 300,000 in the U. S. Army Reserve, both exclusive of all six-month trainees." In doing so it reiterates that this is at very best a minimum strength representing a hazardous risk.

Modern Arms and Equipment

The Need for Qualitative Superiority

A BASIC STIPULATION to the concept of a compact, hard-hitting U. S. Army is that it be armed with weapons and equipment superior to those of the Communists. As the Chairman of the Joint Chiefs of Staff has said; "We will not attempt to meet his masses of soldiers with masses of our own. We will meet him with superior weapons, equipment, techniques, and tactics."

But the bitter truth is that the U. S. Army today has not the superior weapons and equipment that are necessary if the Army's superior organization, tactics, and techniques are to be realized.

The bitter truth is that today's U. S. Army is not only outmanned by the Communists; it is outgunned.

Sixty per cent of the Army's present inventory, in terms of dollars, was procured during the Second World War and the Korean War, and another ten per cent was acquired even before World War II. Only 30 per cent has been procured since the end of the Korean War—almost six years ago.

This isn't a pretty picture. Today, U. S. divisions

in the Far East, in Europe, and in the Continental United States, are armed with obsolescent weapons and equipment which should be replaced with new items that have been developed and are awaiting funds for production in quantity. The barrier impeding the rearming of the Army is fiscal rather than technological.

With some few exceptions, the weapons and equipment needed to modernize the Army have been developed.

For its infantry and armor spearheads, the Army needs new rifles, machine guns, antitank rockets, and tanks.

To provide its spearhead forces with supporting firepower, its artillery needs missiles and rockets for both surface-to-air missions and surface-to-surface missions, new atomic cannon and other artillery, including mortars.

For air mobility it needs many more helicopters, flying cranes, and light aircraft.

It needs portable bridges, foxhole diggers, radios and radars, target-detection devices, infrared devices, and radiation detection devices.

This partial listing suggests that the scope of the Army's modernization problem is all-inclusive, extending from what the soldier needs to wear and to eat, to the weapons he will fight with, to his battlefield mobility, and to his commander's need for communications and electronic surveillance and target-finding equipment.

The Army exhibited courage and foresight of a high order in reorganizing its divisions from the triangular organization of World War II and Korea into the five-sided Pentomic division. It took a considerable risk in doing so because the full effectiveness of the new organization is largely dependent upon new weapons and machines presently unavailable in sufficient quantities to rearm the active Army, not to mention the Army National Guard and Army Reserve.

The weapons and machines that will give our Pentomic divisions the mobility and striking power they must have if our Army is to be qualitatively superior to the Soviet Army are available for production. The problem is to obtain sufficient funds to produce them in sufficient quantity to give us qualitative superiority.

How much would it cost? Any over-all figure would be no more than a guesstimate. Unknown factors include such things as the cost of new items when in full production (small "educational" orders are much more expensive than one large production order), and rising costs.

For the past few years the Army has been spending about $1.4 billion annually for procurement of weapons and equipment and has found that this sum doesn't quite stretch to cover normal replacement. In other words, year by year, the Army is falling a little further behind, its hardware becoming more obsolescent.

The Army Chief of Staff has proposed a five-year program calling for the expenditure of $3 billion a year. This would provide $1.5 billion for holding to the present level and $1.5 billion for producing new weapons and equipment for all of the Army's active divisions and some of the divisions of the Army National Guard and Army Reserve. This represents a considerable risk in the event of mobilization, since divisions that were rearmed with the new weapons would not be compatible with divisions that had not been rearmed. For example, two sources of supply would be required if a division armed with the new 7.62mm rifle and M60 machine gun was in the same area as a division still armed with the caliber .30 rifle and machine gun. This would be a logistical nightmare and an unacceptable operational hazard.

In a press conference on November 13, 1958, the Secretary of Defense said: "What I think is needed in the case of the Army is to modernize the Army forces, and that we hope to press forward with." This was essentially modest encouragement of an essentially modest program. And yet the slight hopes it raised were dashed when the Administration's Fiscal Year 1960 budget became public. For modernization next year the Army is to have less than $1.4 billion for hardware. The Administration's plan does not provide sufficient funds to offset the rate at which Army weapons and equipment are becoming obsolescent. In a few years all components of the U. S. Army will be armed with obsolete weapons and fewer of them. The Administration's budget makes a sham of the once bold idea that we would offset the enemy's superiority of manpower with superior weapons. Today the Soviet Union is superior in both manpower and weapons.

The Army's five-year program involves risks. It should be started at once. The implications of the Army's "hardware" problems in this age of technological transition in weapons and equipment are plain:

modernization is never finished. It is a dynamic, not a static, process. It cannot stop if the weapons of the U. S. Army are to be qualitatively superior to those of its enemies.

Requirements of the Future

MOST AMERICANS think of technological progress in terms of machines that ease their workaday burdens: automatic washing machines and power mowers for the home, electric typewriters and automatic bookkeeping machines for the office, mechanical harvesters and hydraulic lifters for the farm. More rarely do they think of technological progress in terms of automatic processes in making steel or automatic quality-control devices that assure better products at lower cost.

But it is the other way around when the average American turns his thoughts to military weapons and machines. He is hardly aware of such homely devices as a foxhole-digging machine but he can become quite excited about a nuclear-powered submarine or a 5,000 mile range missile.

This lack of understanding of the Army's need for improved weapons and machines that don't make exciting subjects for a newsreel makes it difficult for the Army to establish a public awareness of its need for research and development that would produce weapons and equipment which would improve the effectiveness and possibility of survival of that all but forgotten man, the combat soldier on the lonely battlefield.

To increase the effectiveness of this combat soldier and his battle leaders, Army research and development seeks to give him weapons and machines that will make him better able to defeat his enemy and to improve his ability to survive under the extremely difficult conditions of the future battlefield.

To make him better able to defeat his enemy, the Army has programs that seek to—

Improve existing and create better weapons;

Increase the soldier's battlefield mobility on the ground and through the air;

Develop communications and equipment that will give the soldier's leaders a faster and more reliable means of controlling and directing the course of the battle;

Develop surveillance devices that enable the soldier to know where the enemy is and what he is up to;

Develop tactical methods that will fully exploit the new weapons and machines and are amenable to the conditions that can be expected to exist on future battlefields.

To improve the soldier's ability to survive on the field of battle the Army has programs that seek to—

Discover what kind of men make the best fighters and to separate the fighters from the non-fighters before they reach the battlefield;

Improve the training of both the soldier and his leader;

Provide the soldier with protective devices such as armored clothing;

Provide him with clothing suitable to the climate in which he finds himself, with nutritious food that is not so bulky as to make supply difficult under tactical conditions, and with medical care that will give him a good chance to live if he is wounded or injured.

To achieve these programs the Army must have continuing programs in both basic and applied research. While it can and does rely on the work of other government agencies and non-government research activities, it cannot depend solely on these because many areas of extreme importance to the Army are inadequately explored by other agencies. In the same way the results of Army research are available to other agencies.

Military research and development by its very nature is a never-ending quest. One development inevitably suggests another and better method or device. For this reason Army research and development must be geared to the long haul with adequate funds for a strong and progressively improving program.

Only a strong and progressive research and development program can reduce the time lag between the time the fighting Army states a need for a specific weapon or piece of equipment and the development and production of the item and its delivery to troops.

To assure the nation that the Army of the immediate as well as the more distant future will be capable of performing its assigned missions, it is essential that a strong and well developed Army research and development program be maintained at all times.

(Other portions of this statement consider, among other subjects, the Army's mission in air defense, and develop the Army's need for aviation and for tactical and strategic airlift.)

The Quartermasters Go Underground

To protect supplies vital to the combat forces from atomic destruction, the Quartermaster Corps is experimenting with underground storage

CHIEF WARRANT OFFICER EUGENE W. HILTON

NEANDERTHAL man had the good sense to come in out of the rain. His shelter in the warmth of a cave may have been crude, but it was good protection. Twentieth century man may return to this environment. Lest he return to the primitive, man again thinks of the earth as his best friend.

Lieutenant General Carter B. Magruder, Deputy Chief of Staff for Logistics, has observed: "What can be seen can certainly be destroyed. What can be located accurately can probably be destroyed unless it is far underground. . . . As a result, attacks of depots with atomics may cost us many of the supplies we have delivered to the [overseas] theater. I look to the greatly increased use of underground or other protective construction to protect the supplies that we do continue to provide."

Since the quartermaster is principal purveyor to the armed forces, a sizable portion of this problem is squarely up to the Quartermaster Corps. The food the fighting man consumes, the fuel that moves him about, and the clothing he wears into battle must be protected before issue. Stockpiling the quartermaster's supplies in CONUS is a mutual problem. In a theater of operations it is mainly the QM's.

The smallest quartermaster supply point is atomic fair game. Should the QM go underground? If so, how deep? Where? How often? Should he figuratively wear an intrenching shovel as a sidearm? To survive and supply, the quartermaster must dig. To make digging intelligent, he must know field fortifications, fundamental geological facts, and simple engineering principles and practices. Nonetheless, mobility remains paramount. Protection is one thing. Getting the food, fuel, and clothing to market is the payoff.

Mindful of the need for maximum protection, the Quartermaster Corps is studying the business of protective underground storage. For security reasons details of these activities cannot be published. We can say, however, that U. S. Army in Europe has surveyed and uses certain underground spaces as caches for combat-essential gear. Site Blank, according to a report, is "in wooded area with narrow paved road . . . now in use by Quartermaster [with] 201,000 rations stored . . . dry and well finished." Another: "In isolated wooded area. Could be expanded. Good road with space

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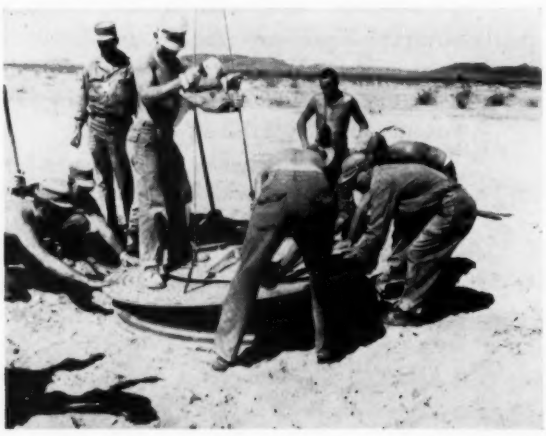
UNDERGROUND SHELTER of steel is tested at Yuma, Arizona, by the Army. Air passes through the perforated holes in the cover (shown being put into place in the picture at right) and is then drawn through the rocks and the holes in the inner casing.



for turnaround. Quartermaster has rations stored." Of still another site, the report says: "Now [1957] under control of [QM] Group which will use for storage and shop." These are indicative.

In several overseas areas quantities of POL are stored underground or are carried through subterranean pipelines. In Spain, the Air Force has some underground storage and about 470 miles of such pipeline. On Okinawa, all pipeline and tankage is planned to be underground, with approximately 1.3 million barrels presently so stored. Underground tanks in Japan contain some 10 million barrels of petroleum products. French Morocco, France, and Germany are included in the areas having underground POL tanks or pipelines, or both.

A nuclear battlefield will demand hasty liquid-fuel storage facilities. We are studying the feasibility of augering inverted craters, lining them with an impervious sheet, and providing a floating cover. These may be either at ground level or of low silhouette. In either event, vulnerability to blast pressures and ground fire would be greatly reduced. Capacities of 1,000, 10,000, and 50,000 barrels have been proposed.

To further the underground protection plan of DCS-LOG, The Quartermaster School at Fort Lee has courses in underground storage in theaters of operations. The scope includes underground storage under atomic conditions; types of storage in relation to terrain features; advantages and limitations; field expedients in connection with underground storage; and current experience with underground storage in overseas theaters.

Lively discussion develops from this instruction. Is underground protection too expensive? Would it prove inflexible? Are distances between combat elements too great to make it feasible? Is it workable only in a base section? The cogency of these questions, and the efficacy of the concept itself, can be proved only by atomic battle.

Possibly this definition of underground storage will settle any doubts (the *Dictionary of United States Army Terms* provides no clue): Underground storage facilities may range from ditches to labyrinths. In other words, underground protection is any shield provided by the use of earth. This definition is a bow in the direction of battlefield expediency and reality. Engineer studies conclude that specially designed or "improved" underground sites provide the maximum possible protection against atomic blasts. But combat seldom allows for the ideal. Nonetheless, the use of earth is the best means at hand for protecting men and supplies.

Where shall we dig?

The quartermaster will be denied the use of portions of what is dug in. He cannot bury supplies, settle back and say, "There; now I'm ready for anything." The Germans found that safety did not mean usability. No successful destructive attacks were made on German underground industrial installations during World War II, in spite of positive knowledge of their sites plus unrelenting bombing. Output actually increased. After-

THE GERMANS in World War II set up this machine shop in a French cave two miles under the surface of the earth

action reports verified the vulnerability of lines of communications as the Germans' undoing. By forfeiting supply lines, they were overwhelmed in the midst of relative plenty. The Hitler war machine and economy collapsed.

Underground storage, essential as it is, must not impede movement. A balance between integrity of stores and preservation of movement is the starting point for digging doctrine. This tenet applies from oil drums protected by a trench, all the way to balanced depot stocks in elaborate underground structures providing "ultimate protection" against an ultimate weapon.

In a theater of operations, existing underground structures should usually be favored over new construction. Natural features include caves and defiles. Man-made shelters include tunnels, mines, basements, and excavations. Ready-made features may stubbornly appear where not wanted. Nonetheless, speed and convenience favor them. Time-to-move-in and time-to-get-into-operation are ruling factors on fluid battlefields. It is easier to disguise existing sites. It is also cheaper in men, matériel, and money to take possession of an existing hole. New construction is not ruled out; it will be essential. Conversion and improvement of the old are musts. The nod, however, goes to what Nature and men have provided.

Necessity and efficacy dictate when, where, and how to start new diggings. New construction may range from the hasty to the elaborate. For example, Base Section may be newly occupied, tenuous, lack the capacity to protect or disperse incoming supplies. Trenches may afford the only cover for fuel drums. Conversely, units near the point of contact may find it expeditious to dig fairly elaborate shelters. Configuration and geology also dictate location, degree, and type of new underground

construction. Another governing factor is the unit's organic digging capability, which is limited. It could be enhanced by including earth-moving gear among its equipment. Arm-and-shovel power may be most adept in support-type units moving with combat divisions. Extensive or elaborate underground construction is a job for the Corps of Engineers. Quartermaster commanders, from distributing points to depots, must be resourceful. Terrain appreciation is demanded. Sometimes men must burrow for themselves.

Planning underground storage should precede moves into a theater of operations. The QM officer, therefore, should be familiar with geographic and geological studies of the area. Political, demographic, religious and ethnic peculiarities are important. Where NATO or SEATO forces exist, we may work with leisure. Underground bastions are a possibility. In any event, it appears inconceivable that we can go into an area—or stay in one we already occupy—without some extent of underground storage. Not to have an underground storage plan is negligent; yet, to be hamstrung by it is foolish.

Quartermaster troops must dig with avidity. But it must be an intelligent, planned act, not one of desperation. If a cave would be welcome, but none is at hand, hasty intrenchments, embankments, or shelters may have to fill the bill. Semipermanent protection may wait until enemy contact is not imminent. There are many variations to field fortifications that can be adapted to quartermaster operations. Digging will require that the QM officer master military principles not specifically connected with supply.

Protecting the burrow

Shelters physically occupied by personnel must have more than one exit. This principle must have first priority in an "improvement" schedule. When a cave is occupied, alternate tunneling must be done. Sites used to cache "inactive" matériel must be guarded. Extending the principle of alternates, and to obviate bottlenecks, more than one road or path should lead underground. Defiles without deadend, and hasty fortifications that allow for speedy evacuation, may be favored. Without exception, storage sites ought never be inherently hazardous.

When withdrawing, supplies and protective covering must be thoroughly destroyed. Explosives, fire, water, and chemical agents may be used singly or in combination. Supplies must be rendered useless, and the rehabilitation of the site made most expensive to the enemy. Radiation is effective when there is little chance of our eventual return to the area. We must take with us only those supplies and cover we urgently need.

The effects of nuclear fallout, as well as those of chemical and biological agents, must be guarded against. Underground shelters intended for full-time occupancy should be equipped with air-purifying apparatus. Shelters unoccupied by men must be sealed, with due regard for temperature and humidity.

Quartermaster officers may be called upon to construct or "improve" underground facilities. They must be familiar with rudimentary geological and engineering principles. As a geologist, the QM must know that mines are poor hiding places because of their unstable ceilings, and that dust and gas can lead to disaster. He must know that underground structures may be dug in virtually all soil formations, but that the most favorable are limestone, granite, and sandstone. He must know something of stratification, and that sites on sides of hills and mountains are drier and less likely to give trouble from ground water. As an engineer, he must know that hillside locations afford more convenient entrances and exits, and better ventilation, and that they simplify sewage disposal. The quartermaster digger must be familiar with the rudimentary principles of mucking. He must understand that usually the professional engineer is using familiar surface methods, machinery, and process when he digs a hole. The layman must, in all events, apply horse sense. He must not dig over his "depth." If elaborate excavations or improvements are required, the selection of sites is better left to the geologist. The means and the methods are subjects for the trained engineer.

The safety factors

Gasoline must have separate underground storage. Capacity, location and dispersion, structural specifications, and communications require the joint efforts of all the arms and services, plus those of the Air Force and the Navy. Underground pumping stations, pipelines, and bulk-dispensing points are best. Alternate complexes are added protection. An invading force may have to exist on underground POL improvisations for an extended period. Theaters such as continental Europe can expend advance effort to bank the blood that flows through mechanical monsters.

Regardless of the nature of an underground structure or of its contents, established warehousing practices are constants. Yet optimum conditions may be hard to come by. The lack of the ideal, nonetheless, does not justify the abandonment of sound storage practices. Drainage is essential; dunnage is highly important; temperature and humidity controls, however primitive, are required; classification procedures are necessary; workability of "live" stores must be provided for; rotation of stocks may be more important than during aboveground activities; stacking should resemble normal storage; in some cases, matériel-handling equipment may be used; and stock control is a must. Modifications, however, are anticipated. Combat, geological, or weather conditions could dictate the abandonment of certain precepts. On occasion, only time may allow application of any of them. But variables do not minimize the essence of proven precepts and procedures.

Underground general depots and their complexes may not be such in the traditional sense. A depot may be a repository for variegated supplies held against dire emergency, or a mixed, working capital of ready resupply. In either circumstance, the versatility of multiple

storage provides a position of strength. Small, underground general depots should accept only need-to-have articles. Wise dispersion of these depots should require the least possible time for consumer goods to remain aboveground. Locations will be affected by the proximity of points of entry into the theater, the locations of other depots, and accessibility to marshalling areas.

How close to the customer?

The relative proximity of supplies to the opposing ground forces may dictate the scale, degree, and number of underground storage sites. The relationship of the point of contact to the base of supplies may suggest how deep to dig and how much to stock. An assumption is that large stocks, well entombed, are safest and most usable when held well to the rear. Conversely, at or near the front, the depth of subterranean shelters and the stocks of supplies may normally be the least. The gradients between these opposites are assumed to be in descending proportion—rear to front. With progression from rear to front, the correlative factor of dispersion acquires magnitude. The more elaborate and replete underground chambers may be fewer in rear areas; shallower covers near the front may be greater in number and more widely scattered. We must not, however, be diverted into an oversimplified formula.

Standard plans and specifications cannot be set up for any type of underground storage construction. In fact, recourse to such protection is a classic example of improvisation and expediency. The diversities of geography, geology, flora, weather, and existing underground sites challenge the imagination and skill of the leader. The state of the conflict has the ruling hand. Much must be resolved as a reasonable compromise. The test will be whether this compromise results in a workable storage and issue plan. Natural and man-made features that assist dispersion, camouflage, duplication, and transportation in the face of an enemy govern much of what we can profitably protect underground.

There is neither historical nor engineering precedent for standardization. In a survey of foreign underground installations, rooms up to 100 feet high and 100 feet wide were encountered. The Corps of Engineers favors large mines for general-depot type storage. However, they conclude: "Except for storage of larger units, room sizes and ceiling heights are not of primary importance." Specifications for both active and dead storage are elastic. Rock firmness and stratifications affect the size, layout, and support for a given depth of cover. The same is true of general configuration of the earth's surface. A variety of considerations dictate the length, direction, and size of corridors, the arrangement of bins, and the number and positioning of portals. Entrances and exits usually conform to Nature's whims. Large concentrations of men within an underground structure necessitate extensive heating, ventilation, and air-conditioning. Room size and shape are also affected by the size, shape, and nature of the articles stored. Because of their volatility, POL products must have ventilation and fire protection. Where dead storage is involved, some restrictions can be ignored. In sum, standardization is out of the question.

Soldiers working underground may be confined to shelters for several days after an atomic blast. The fallout may arrive soon after at shelters relatively near ground zero, and the initial radiation dose can be high. Where contamination is serious it will be necessary to spend the first day or two shielded from residual gamma radiation. Although workers may be saved from destruction, they can be temporarily out of action.

Not a substitute for other means

Going underground may be a psychological trap. At times bunkers and foxholes can be the undoing of combat troops. Men are not inclined to move when they feel protected. Thus, they must be made aware of the false sense of security that is engendered by hiding. Training before combat must substitute for sad experience. The small-unit leader must face the fact that he and his men may become afraid to venture from their protective cover.

Underground storage is *not* a substitute for other means of protection. The Germans' belief that their program of hasty underground storage, and their more deliberate and extensive industrial digging schedule, is historical proof that their methods were not the whole answer. Advice to go underground must not draw the inference that this is the complete solution to the hazards of atomic, or even "conventional," warfare. The protection of the earth should be sought in conjunction with all other passive measures of defense. Underground storage goes hand in hand with the precepts of multiple stocks, dispersal, smallness, and mobility.

The need for the quartermaster to go underground to protect himself and his wares is recognized. Implementation, nevertheless, is restricted by availability, possibility, and capability. The means may not be at hand: tools, favorable sites, building materials, mechanical equipment, or areas that can be adapted. Thus, the possibility often may be limited. The engineering capabilities of quartermaster troops are limited. They may have neither engineer support nor a handy labor force. Thus fettered, logical improvisations must develop. Resourcefulness is the best bet. Success and survival demand the ability to extemporize.

One engineering firm that is under contract to the Corps of Engineers tells us: "The basic conclusion to be drawn . . . is that, with proper planning and use of adequate mechanical equipment, storage . . . underground can be made highly successful." Applying the conclusion, cold war is an interim during which to plan ahead for operations in a potential theater.

Without underground protection, quartermaster goods and services—not to mention their handlers—could disappear from the battlefield. The fortunes of both cold war and hot war determine where and how digging may be done. The "optimum" envisaged is elusive. Atomic jousting calls for superlative leadership and ingenuity.

**TO POOL OR NOT TO POOL—
AND HOW MUCH TO POOL**

For economy of means the consolidation of divisional motor transportation in an organic transportation unit is an attractive possibility. For efficiency of military operations it can create difficulties. Here two articles explore the subject.

To Pool or Not to Pool: AN HISTORICAL SURVEY

JOSEPH BYKOFSKY

ON 23 August 1956, General Maxwell D. Taylor, the Army Chief of Staff, in issuing a directive that laid down guidelines for the reorganization of the infantry division, placed heavy emphasis on the need to conserve and pool divisional motor transport. "The new division," the Chief of Staff declared, "must contain the minimum number of vehicles necessary to accomplish its mission." He made specific provision for the establishment of a transportation battalion as an organic part of the division. "The manner and extent of pooling vehicles within the division for incorporation in . . . the transportation battalion are matters of deep concern to me and should be closely examined in an effort to obtain maximum utilization of divisional transportation," he wrote.

This was a significant forward step. One of the striking paradoxes of modern warfare has been the limitations imposed on the mobility of combat forces by the very equipment provided for their transport. The steady increase in the number of organic vehicles assigned to divisions has not resulted in a concomitant increase in movement capabilities. In both World War II and the Korean War, logistical and tactical moves were handicapped by the clogging of roads with slow-moving, road-bound convoys, by the piece-meal employment of motor transport and by congestion at supply dumps, river crossings, road junctions and other traffic arteries.

The advent of nuclear weapons and other technological advances and the consequent requirement for greatly enhanced mobility, dispersion and flexibility intensified this problem. It became increasingly apparent that field armies could no longer risk maintaining long logistic tails and heavy concentrations of men and matériel. In view of the need for ready deployment and reduced vulnerability, divisional transport would have to be kept to a minimum. At the same time, there was need for developing greater cross-country and off-road movement capabilities and for achieving more efficient and responsive utilization of motor transport.

These considerations were taken into account in the Pentomic recomposition. In making the transition, the Army has adopted as a basic objective the attainment of leaner, faster-moving and better supported forces through the pooling at higher echelons of organic equipment not regularly used by combat organizations. With this goal in mind and on the basis of his own experience in Korea, General Taylor made provision for the establishment of a Transportation Battalion in the new experimental infantry division. Such battalions, activated starting in early 1957, had the missions of providing the divisions with tactical assault mobility, logistic support and transportation staff planning.

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Field evaluations of the Pentomic division's transportation battalion have been completed, and are currently under study. Though subject to various limitations, these evaluations are potentially of great importance to the Army. Here is an opportunity to gauge the battalion's capability for effectively and swiftly moving and supporting fighting forces under contemplated conditions of future warfare. On the outcome may well depend the retention of the transportation battalion on a regular basis in the infantry division, and similar extensions of the concept of pooled, centrally-controlled transport to other type combat divisions and at the corps level of the field army.

The Pre-Korean background

The concept of improving combat zone transport through the pooling or consolidation of organic motor vehicles is by no means new. It had been considered almost from the inception of large scale mechanized warfare. During World War I, virtually all combat divisions in France had adopted some form of pooling. Only the Armistice forestalled plans for the assumption by the Motor Transport Corps of the AEF of operating control of the trucks in the armies. It was officially urged that its essential features—pooling, centralized operation and traffic control—receive careful study in the future.

Other expressions of the pooling concept were voiced in the inter-war years. To adapt the division to open warfare, the War Department in 1936 had laid down the principle that motor transport, along with other appropriate equipment and forces, should be pooled. This principle was considered in studies and maneuvers leading up to the reorganization of divisions along "triangular" lines, but little appears to have been done toward carrying it into practice in the field of motor transport.

Wartime ocean shipping and rubber shortages again focused attention on the matter of motor transport in divisions. Writing to General Lesley McNair, Commanding General, Army Ground Forces (AGF) in September 1942, General George C. Marshall warned that "our figures as to divisional transportation were extravagant," and "represented what a division commander asked for rather than meeting the problem on the basis of over-all requirements." Agreeing with this estimate, McNair stated that "the present regrettable excess of motor transportation is due to chiefs of arms and services seeking heavily and thinking narrowly, to field commanders who seek to make their units too self-contained, and to an over-indulgent War Department." Under a proposed revision of AGF organizational tables, issued in March 1943, provision was made for a 23 per cent reduction in the number of vehicles in the infantry division. This would be accomplished by cutting organic transport to the bone, and by providing divisions with additional transport as required through the attachment of QM truck units maintained in an army pool. Most of the vehicles proposed for withdrawal were restored, however, following strong protests from the theaters.

Although the Transportation Corps (TC) had been assigned operational control over Quartermaster trucks in the communications zone in World War II, it had not, like its older sister technical services, received staff or troop representation in the combat divisions. This situation was not significantly altered by the transfer of truck companies from QM to TC jurisdiction in July 1946. Organic trucking elements of the divisional QM companies were not included in the transfer, since they were not specifically identifiable as transportation units, and were primarily engaged, in theory at least, in the movement of QM supplies and equipment. As a consequence, special staff transportation functions in the combat divisions continued to be performed by the division Quartermaster, and general purpose hauling was conducted by the organic vehicles of the QM company, the division's headquarters company, the division artillery and a variety of other units. The Army Chief of Transportation urged that appropriate divisional transport be pooled and incorporated into separate motor transport units under the control of a transportation staff officer. This proposal was not adopted. The sole formal recognition given to TC at the divisional level was a provision for a transportation officer to serve as an assistant G4.

Tests in Korea

Experience during the Korean War, coupled with the increasing emphasis on austerity throughout the Army, brought a revival of interest in the problem of organic transport in the combat divisions. Aside from receiving close attention in various paper studies, the pooling con-

cept underwent thorough field testing in Korea. By the spring of 1953, it had become apparent to General Taylor, then commanding the Eighth Army, that "the infantry division had many more cargo vehicles than were required for Korea, and that the control of such vehicles was dissipated throughout the division." Just as firepower and engineer support were effectively controlled by the division artillery commander and the division engineer, so it appeared that improved logistic support and mobility, as well as substantial manpower and equipment savings, might be realized by centralizing a portion of the division's organic vehicles under a division transportation officer.

In line with this thinking, two tests were run during 1953. The first, conducted during the period 18 May-16 August, involved the attachment to the U. S. 2d Infantry Division of a transportation truck battalion with three companies of 60 task vehicles each. The battalion was placed under the operational control of the division transportation officer. A compensating number of organic vehicles was immediately withdrawn. Additional trucks were taken out of operation as the test progressed and the battalion demonstrated its ability to handle the workload. A peak number of 425 vehicles was withdrawn before the end of the test. Under this arrangement, the battalion provided the division with vehicular support under both non-combat and combat conditions.

Results of this test were generally favorable, though not entirely conclusive. It was found that the employment of the truck battalion resulted in more efficient vehicle utilization, permitted the division commander to mass and control this transport effort, and provided the corps commander with a ready source of vehicles. It was reported that under Korean conditions substantial savings in vehicles (154 per division) and personnel could be effected. On the other hand, the placement of previously organic transport capabilities at the divisional level appeared to reduce the ease with which regimental commanders could effect their mobility and support, and to require improved communications and greater coordination.

Greater flexibility and mobility

While recognizing that the pooling concept appeared to have disadvantages as well as advantages, General Taylor believed that the principle of concentrating transport capabilities had great merit. He therefore recommended that the whole problem of division mobility be re-examined in light of the test. The same sentiment was expressed by the theater headquarters, which urged further tests in other oversea commands to develop conclusive data upon which to effect possible reductions in total divisional vehicular authorizations.

In the second test, conducted by the U. S. 45th Infantry Division in the period 22 August-20 November 1953, the pooling principle was applied without the use of a transportation truck battalion. Truck platoons were organized below the division level—three per service company in regiments, two in the tank battalion and four in the QM company. The platoons remained with their home units, but were placed under the operational control of the division transportation officer. Organic vehicles determined to be in excess were administratively deadlined. Although results were limited by the absence of combat conditions and the non-participation of the division artillery, findings were generally favorable. All regimental commanders voiced their approval of the pooling arrangement. A saving of about 100 vehicles had been effected, and it was reported that greater flexibility and mobility had been attained.

Of the two arrangements tested, the former appeared more promising to the Eighth Army. As a follow-up, plans were drawn up for a phased program, under which required general purpose trucks would be centralized in a truck battalion organic to the infantry division, and non-essential vehicles would be withdrawn from other divisional units. In a test of this concept, a provisional truck battalion was activated in the U. S. 24th Infantry Division. During three months of operation (July-September 1954), the battalion demonstrated its ability to meet the normal day-to-day needs of the division. Only when unusually heavy requirements arose, as in the case of division-size field problems, was it necessary to call on transportation units in the Army Service Area for additional support.

The issue remains in doubt

While developments in Korea were thus lending weight to the idea of centralizing transport capabilities in combat divisions, little progress was being made in applying the principle elsewhere overseas and in the Continental U. S. A field test looking to vehicle reductions in an infantry division was conducted in Germany by the Seventh Army in 1954, but proved disappointing. Limited to an evaluation of basic loads of organic vehicles under various conditions, the test involved no consideration of savings to be gained through pooling or the use of a transportation truck unit. As a result, only minor vehicle reductions were reported.

There was no attempt to apply the findings of the Korean tests in the 1954-55 studies and tests of the proposed reorganization of the infantry and armored divisions under new "ATFA" (Atomic Test Field Army) concepts. While providing for substantial personnel reductions, the proposed reorganization actually increased the number of vehicles in combat divisions. In neither type division, moreover, was provision made for handling transportation as a separate and distinct function. Truck units and transportation staff officers were placed in a combined transportation and supply organization under the command of a QM officer.

Impact of Pentana concepts

For reasons outside the scope of this study, the proposed reorganization along ATFA lines was not carried out. Although many of the lessons learned in the ATFA tests were applied, it was decided to reorganize the current divisions under concepts set forth in the longer-

range Pentana studies looking to the development of a "dual capability" Army which would be equally effective in atomic or non-atomic warfare. In the broad organizational and doctrine guide-lines laid down in the Pentana studies, stress was laid on greater strategic and tactical mobility; improved flexibility, firepower and communications; and expeditious logistic support. To provide for the necessary movement capabilities, battlefield dispersion and operations in depth, the Pentana army would be built around small, mechanized and air-transportable divisions, each with five integrated, self-sufficient combat (subsequently called "battle") groups of approximately battalion size. In addition to these five groups, each division would have a command group and air, artillery and logistic support elements.

While the ultimate goal was a single-type, fully air transportable division, it was recognized that accomplishment of this objective would have to be an evolutionary process, geared to technological advancements, budgetary considerations and other factors. Requirements were therefore developed for the completely air-transportable airborne division, the infantry division, and the armored division. In all three types, logistic support was functionalized under a support command (armored divisions) or a division train (airborne and infantry divisions). The planned reorganization was begun in the airborne divisions in the latter part of 1956, and was begun in the other types early in the following year.

In the transformation of the combat divisions into Pentomic organization, the pooling concept was adopted, and provision was made for separate transportation staff and troop representation in the new infantry division. In his August 1956 directive providing guidance for the reorganization of the current infantry divisions, General Taylor, as indicated earlier, called for reductions in the number of vehicles and stressed the use of pooling as a medium for attaining fullest possible use of motor transport. He further furnished a model organizational chart, which included, under the division trains, a transportation battalion with two armored personnel carrier companies and one or two truck companies.

The Taylor pronouncement, however, did not serve as a *carte blanche* for similar arrangements in all combat divisions. In both the reorganized armored and airborne divisions, formal provision continued to be made for an organization performing both supply and transportation functions. The sole recognition given to transportation as a distinct function was the inclusion in the Armor TOE of a separate Transportation staff section. There was the prospect, however, that favorable experience with the transportation set-up in the infantry division would influence the future assignment of vehicles in the other type divisions.

Initial experience in the infantry division

The first of the current infantry divisions was reorganized in February 1957. The others subsequently underwent similar conversion on a scheduled basis. The new leaner division was 13,748 strong, in contrast to the 17,455 of its predecessor. In line with General Taylor's emphasis on austerity and pooling, the number of general purpose vehicles in the division was cut by 657. Despite some offsetting increases in special purpose vehicles, the total number of divisional motor vehicles was reduced from 2,478 to 2,039. This cutback was in large part premised on the inclusion within the division of the transportation battalion, which would provide a pooled resource for the more efficient and economical accomplishment of motor transport missions.

The decision to include the transportation battalion in the Pentomic infantry division was followed by work to develop suitable organizational structures and doctrines. Tentative tables of organization and equipment for the battalion and its assigned units were issued in late 1956. Formal Army-wide guidance on their organization, missions, major items of equipment, functions and employment was published in a field manual in the following July.

As envisaged in these documents, the transportation battalion would have both tactical and logistic support missions. It would provide cross-country mobility to assault elements of an infantry division; furnish infantry battle groups with a means for rapidly exploiting the effects of mass destruction weapons; and effect administrative and logistic hauling of personnel and supplies. The battalion would further handle transportation staff planning for the division, and would possess the capability of fighting as infantry when required.

To accomplish these missions, the battalion was authorized a complement of 532 officers and enlisted men, organized into a headquarters and headquarters company, a truck transport company and two armored carrier companies. Wearing two hats, the battalion commander headed up the assigned unit and also served as the division transportation officer. In the latter capacity, he provided advice on transportation matters to the division commander and his staff, engaged in movement planning, prepared the transportation portions of administrative and logistical orders and plans, and exercised operational control over the division traffic headquarters charged with highway regulation. To assist in the discharge of its duties, the battalion headquarters included a small transportation staff section, normally located at the division's main command post. The rest of the headquarters, operating in the division service area, provided the commander with means for the direction, coordination, administration, supply and organizational maintenance support of the assigned operational units.

The battalion's operational units would be dispersed throughout the division service area depending on mission or probable employment. The transport truck company had the task of providing transportation for the tactical and logistic movement of personnel and cargo for a division. Larger than its normal Transportation Corps counterpart, the company was equipped with 80 task vehicles (2½-ton, 6x6 trucks, with 1½-ton, 2-wheel trailers). Based on 75 per cent vehicle availability, the

unit could transport, in one lift, 240 short tons of general cargo or 1,200 men or any appropriate combination thereof.

While the company was designed for operation as a unit, it could be used as platoons or squads if necessary. For tactical operations, all or part of the company could be attached to combat elements on a mission or time basis, or it might be placed in support of division units. The company came under the operational control of the division transportation officer, except in the event of attachment to a combat element. In the latter instances, the truck company, or the subordinate component involved, received orders from the unit receiving the attachment.

Armored personnel carriers

The other two units, the armored carrier companies, had the primary mission of providing combat elements of the division with both on-road and cross-country mobility, and the secondary task of effecting resupply and medical evacuation under fire, or where terrain conditions rendered the use of other vehicles impracticable. To these ends, each company was authorized 54 full-tracked, M59 armored personnel carriers (APCs) as task vehicles. The versatile M59 had excellent cross-country capabilities, possessed the ability to negotiate water obstacles and gave protection to troops or cargo being transported. A rear ramp and cargo hatches permitted rapid loading and unloading, and a caliber .50 machine gun could be used to support infantry action. Based on 75 per cent vehicle availability, the APC company could move 440 troops or 60 tons of cargo in one lift. Employing all vehicles, each of the unit's three platoons could transport the rifle and weapons platoon of an infantry company. As in the case of the truck company, the APC companies were primarily intended for use as complete units, but could be operated as separate platoons or squadrons. For tactical operations, the company would normally be attached to an infantry battle group on a mission basis, and would receive orders from the infantry commander. When not attached to division units, they would come under the operational control of the division Transportation Officer.

As already indicated, supporting logistic, administrative and air elements of the infantry division, including the transportation battalion, were grouped under a division trains organization. The battalion was attached to the division trains for tactical command, rear area defense and area damage control, the assignment of bivouac areas and control during periods of relocation, and the supervision of routine administration and supply.

Activations got under way in February 1957. First was the 9th Transportation Battalion organized in the 1st Infantry Division. In subsequent months, additional battalions were organized and commenced unit training. To assist in assuring the successful accomplishment of their mission, the Chief of Transportation sought to provide the battalions with highly qualified officers. As far as possible, individuals were selected who had had previous experience with a combat arm, and who possessed demonstrated qualities of leadership as well as technical competence. In the case of the APC units, which were new to TC, drivers were trained at the Armor School. By 1 July 1958, transportation battalions had been incorporated in 11 infantry divisions.

As experimental organizations, the Pentomic infantry divisions, including their transportation battalions, have undergone close scrutiny. Under a worldwide program initiated in early 1957, reports of field commanders' evaluations were fed into CONARC for use in analyzing the adequacy of the structure. On the basis of these evaluations, recommendations have been made for various revisions.

Definitive judgments regarding the transportation battalion have been rendered difficult by the newness and inexperience of the units and personnel involved, by limited field testing, by equipment shortages (notably APCs), and by some departures from doctrine in employment and organization. Nevertheless, sufficient experience appears to have been developed to justify the conclusion that the introduction of the transportation battalion has added to the division's mobility.

The outlook for pooled transportation

Questions have arisen, however, concerning the desirability of retaining the truck and APC units in a single organization. There is a feeling in some Army quarters that because the primary tactical transport mission of APCs is in forward areas, these units should be manned and commanded by the combat arms. It is therefore proposed that the battalion, less the truck company, should be designated an armor unit and should operate directly under division control. The truck company, engaged primarily in logistic hauling, could remain under the division trains.

Others contend, however, that these are good reasons for maintaining the Transportation Battalion intact. Separation of the APC and truck units would result in a split responsibility for the movement of men and matériel in the division; would reduce the efficiency and flexibility of employment of motor transport; and would necessitate providing additional truck units to the division. It is further held that a transfer of the division APC units to armor would be premature, since there have not been adequate testing and war gaming of the battalion.

While final determinations regarding the role and placement of transportation in the Pentomic infantry division and other combat organizations of the Pentomic army are still to be made, favorable portents for the future mobility of the fighting forces are already in evidence. The Army has developed a keen awareness of the magnitude of the problem of battlefield transportation. Determined efforts are being made to reduce vehicle requirements and to achieve the fullest possible employment and control of motor transport. All indications point to the continued heavy emphasis on pooling as a medium toward the attainment of these objectives.

To Pool or Not to Pool: A PENTOMIC INFANTRY DIVISION MAKES A TEST

LIEUTENANT COLONEL KARL H. ZORNIG

IN order to assure greater and more immediate responsiveness to the tactical demands of assembling and dispersing, a large portion of the Pentomic infantry division's means of mobility has been concentrated in its transportation battalion. This pooling provides the division commander with greater over-all mobility plus a supplemental concentration of firepower and communications which immediately becomes available to the battle-group commander being supported. For the first time, the incorporation of this type of organization gives the division commander direct access to the trained transportation specialist, and by various attachments of the transportation battalion's units places expert skills at the finger tips of the battle-group commander and his subordinate elements.

In order to create an atmosphere in which theory could most easily become reality, the 9th Transportation Battalion (1st Infantry Division) adopted this objective as its goal: To win the confidence of the units it supports with essential mobility. We wanted the rest of the Big Red One to know they could depend on us for essential transportation.

Lieutenant Colonel Karl H. Zornig, *Transportation Corps,* commanded the 9th Transportation Battalion (1st Infantry Division) from April 1957 until his assignment to the Army Logistics Management Center at Fort Lee, Va., last July. Colonel Zornig landed in Normandy with the 5th Engineer Special Brigade, served at SHAEF, and in Korea organized and commanded the U. S. Army's first helicopter battalion.

Our mission is to assure tactical mobility to the assault elements of the 1st Infantry Division for pursuit and exploitation, and for other tactical missions. In addition, our battalion furnishes a pool of vehicles for moving men and supplies, and the staff for planning the transportation of the division.

Since tactical mobility is our mission, let's first compare the mobility of the triangular division with today's Pentomic division.

Additional transportation now organic

What stands out is not the increased over-all mobility, but where that increase is most effective (*Figure 1*). No infantry element of the triangular division could be made completely mobile unless vehicles organic to other combat elements or to the administrative and logistical elements were redistributed. Under the Pentomic concept the transportation battalion can motorize all the administrative and logistical elements, and completely mechanize a battle group too. The advantage is obvious: the division commander can at any time mount a task force of battle-group size without reducing the ability of any element of his division to move its own equipment and basic load.

He can choose for mechanization the battle group that will offer the greatest tactical advantage. He can substitute another as the situation demands, simply by redistributing his carrier companies. No organic vehicles of the division are affected except those of the transportation battalion.

Supporters of the old organization quickly point out

FIGURE 1. COMPARISON OF PENTOMIC AND TRIANGULAR DIVISIONS

PENTOMIC DIVISION	TRIANGULAR DIVISION
Strength 13,748	Strength: 17,457
Vehicles: 2,229	Vehicles: 2,679
Persons per vehicle: 6.2	Persons per vehicle: 6.5
Administrative and logistical units are not completely mobile. Organic truck company of Transportation Battalion can motorize all immobile elements of division except battle groups. Two organic armored personnel carrier companies motorize themselves and one battle group	All elements except regiments are mobile
Number that normally walk: 3,376 (4 X 844 = 3,376)	Number that normally walk: 5,748 (3 X 1916 = 5,748)
Additional transport needed: 169 2½-ton trucks	Additional transport needed: 287 2½-ton trucks
Percent mobile: 75.4	Percent mobile: 71

that the combat elements of the Pentomic division have lost mobility (*Figure 2*). However, the regiment's mobility of 45.6 per cent without support, in relation to the battle group's 40.2 per cent, is misleading. Under either structure the combat elements still can move only their authorized equipment, with basic load, and those people who normally ride. Under either organization the fighting soldier walks.

The fighting soldier rides only when transportation is added by attachment. It is important to note that under the new structure this additional transportation is available in the organic transportation battalion, if the division commander needs it. It does not have to come from the organic vehicles of other combat elements, nor does it deprive the other elements of their ability to move equipment and basic loads.

What happens when we use the transportation battalion to mount the battle elements? When we use that battalion's carrier companies to mechanize six rifle companies, the battle elements become 57.5 per cent mobile. Further, if we allow the division's administrative and logistical elements to remain partially immobile, we can, by using three truck platoons, raise the mobility of the battle elements to 70.1 per cent. In the triangular division we cannot raise the mobility of the battle elements from 45.6 per cent without redistributing vehicles organic to other units.

Transportation battalion's missions

Now that we have compared the mobility of each division, let us look closer at this battalion which provides the increase. Assigned to division trains, the transportation battalion comes under it for administration, rear-area defense and rear-area damage control. This may seem strange in view of the battalion's tactical mission, but remember that the task companies are not with their parent most of the time. Battalion headquarters, therefore, cannot defend itself. Besides, division trains does not control the tactical missions of the transportation battalion. Remember too that the trains commander is responsible for defending the division's rear area. In this capacity he controls the security of all units located between the rear boundary of the front-line battle groups and the division's rear boundary. In general, then, the division commander controls the tactical and logistical missions of this battalion, while the trains commander is responsible for its administration and defense.

The transportation battalion has a headquarters and headquarters company and three task companies. One of these companies (four platoons) has twenty 2½-ton trucks per platoon; the other two (three platoons each) have nineteen armored personnel carriers apiece. Its commander wears two hats: he is battalion commander *and* division transportation officer.

In his work at division headquarters a transportation section assists him in advising the division commander and his staff on transportation matters. He supervises the logistical aspects of equipment and supplies for which the Transportation Corps is responsible. He figures requirements and availability of transportation and how it will be used, supervises the technical operation of transportation, and controls the operations of division traffic headquarters. Traffic headquarters is manned by the movements officer of the division transportation section, augmented by military police, engineers, and others as needed.

The task of simultaneously discharging his staff responsibility and commanding his battalion appears to be insurmountable. But let's examine these tasks and compare them to the means available.

Battalion commander's tasks

First, his battalion's task units are attached to other divisional units most of the time for tactical operations and for the logistical mission of distributing classes I, II and IV supplies to units. These supplies rarely exceed one hundred tons per day. Thus the demands of command are reduced to the minimum. Second, the division traffic headquarters (where the traffic circulation is planned and maintained) can be handled in the normal course of work by the movements officer along with his

job of running the movements program and insuring the division's ability to move. Actually, the area controlled by the traffic headquarters extends from the rear of the front-line battle groups to the division's rear boundary—usually an area approximately ten miles square. Other portions of the division's sector are controlled by the units occupying them.

The battalion's operations-and-intelligence section is organized to function as two distinct units: a combat operations unit, and a highway operations unit. Such an organization can act like the division transportation section. Thus the operations unit can either assist in implementing the division's movements, or, if the division command post is knocked out, provide an alternate division traffic headquarters. It is common practice in the division for the reserve battle groups to be mechanized or motorized and placed under brigade headquarters. When this is done and the force consists of two battle groups (one mechanized by use of two carrier companies and one motorized by use of the truck company) the combat operations unit provides the brigade commander with both a liaison officer and a transportation planning staff.

Supporting and supported units

The supporting unit always furnishes liaison and transportation planning to the task force commander. When one company is attached to a battle element, that company's headquarters fills those needs. When two carrier companies are attached to a mechanized battle group, the battalion S3 and the combat operations unit will normally also be attached for this purpose. The senior carrier-company commander can also perform this function, but with less capability. When the truck company is attached to the motorized battle group, the company commander and his headquarters assume this role; the leader of the truck platoon assigned to assist the division quartermaster in distribution to units acts as liaison officer for that operation. The same method is followed regardless of the size of the unit attached, be it squad or company: the commander of the attached unit becomes transportation advisor to the unit he is supporting.

A supported force, by virtue of its mission, must command the attached unit, though it be a single truck or carrier. Even the infantry squad leader commands the vehicle carrying his squad. Thus the transportation battalion's control over that task unit is limited by having to plan for the time when the attached unit returns to its parent for use in other operations, administrative and logistical aid beyond the supported unit's capabilities, and the training of these companies.

The key to success in training these units is their rapid adaptability to the supported unit's standing operating procedure, its varied methods of operation, and the personalities of the supported-unit commanders.

The necessary planning for the return to their parents of task units immediately upon termination of attachment and deploying them to their next mission is contingent upon warning from division headquarters. This notice must come from the division transportation section as rapidly as possible in order that the battalion staff can plan and prepare orders. Therefore, either the battalion commander or his executive remains in direct contact with division headquarters at all times.

A major factor in the planning is the size of task unit appropriate to a particular mission, expressed in terms of a half squad, a squad, a platoon, or a company, rather than by number of vehicles. This is necessary to insure proper command supervision, firepower and communication. In addition, the task unit must always be kept as flexible as possible by reducing as much of the administrative and logistical load as is feasible. A carrier company may at times have to operate as many as five miles in front of any logistical element. These responsibilities would entail considerably more time during reassembling for redeployment. Therefore, logistical and administrative burdens, such as mess, supply and second-echelon maintenance, are so attached or placed in direct support that they require only minimum movement.

In all the tactical groupings we visualize, the task element is attached by division order; support maintenance and liaison are attached by battalion order, with or subject to the consent of the supported-unit commander. In the final analysis the type of attachment will

FIGURE 2. COMPARISON OF MOBILITY WITH ORGANIC TRANSPORTATION

BATTLE GROUP	REGIMENT
Strength: 1,437	**Strength: 3,521**
Vehicles: 130	**Vehicles: 370**
Persons per vehicle: 11	**Persons per vehicle: 9.5**
There is sufficient organic transportation to lift TO&E and basic load	**There is sufficient transportation to lift TO&E and basic load. Regiment must move in one shuttle as organic transportation is insufficient to carry all persons**
Number who normally ride: 583	**Number who normally ride: 1605**
Number who normally walk: 844	**Number who normally walk: 1916**
Support transport needed: 42 2½-ton trucks	**Support transport needed: 90 2½-ton trucks**
Percent mobile without support transport: 40.2	**Percent mobile without support transport: 45.6**

always be tailored to meet the existing situation.

Maintenance

There remain two major fields—maintenance and communications—both vital to the accomplishment of our mission.

In the transportation battalion, maintenance is concentrated in a platoon organic to headquarters company. This platoon has three sections (one wheeled, two tracked) to conform to the battalion's organic task companies. Each section can provide complete second-echelon maintenance to include inspection, detection and correction of deficiencies, procurement of spare parts, and recovery of disabled vehicles. When all task companies are within the battalion's vicinity, the platoon is normally located in the headquarters company area. This affords the maximum pooling of personnel and equipment, and facilitates supervision. When the task companies are attached to or supporting another element of the division, or are located at a distance that makes maintenance support impracticable from a central location, maintenance support may be provided by attaching the appropriate maintenance section to the company; or by placing the appropriate maintenance section in direct support of the company; or by providing contact teams from the maintenance platoon to visit the units and service the vehicles in position; or by coordinating with the ordnance unit supporting the battle group to provide all or a part of the required maintenance.

The main reason for retaining the maintenance platoon under battalion control, rather than making it organic to the task company, is to give the task unit maximum mobility and flexibility by eliminating responsibility for second-echelon maintenance and evacuation of disabled vehicles. Thus they can move without being encumbered by logistical and administrative loads.

The maintenance platoon leader supervises maintenance, including that of weapons, in the battalion. In the transportation battalion there are 115 armored personnel carriers each mounting a caliber .50 machine gun—quite a reinforcement to the firepower of a supported unit.

Communications

After many experiments, we feel we have developed the best utilization that can be made of communications. First we had to overcome the difficulty presented by the wide area over which our units were dispersed. Normally the division covers an area ten miles wide and twenty deep. The battalion's command net must reach down to squads of carrier companies. To maintain this net it is often necessary for the carrier company's headquarters to serve as a retransmission station midway between platoons and squads on the forward edge of the battle area and the battalion's CP in the division trains area. In this connection, the maintenance platoon's net also affords an alternate but limited route of communications. The communications section operates the net's control station in the battalion's command net, and the battalion commander uses his station in this net to control his units.

There are four other division nets in which the battalion maintains a station: the trains command net, the trains command voice net, the administrative and logistical continuous-wave (CW) net, and the air-warning net. During the past year we have experimented by placing stations in these nets in various sections of the battalion. We have concluded that stations on all nets should be concentrated in the communications section. By doing this, the experience and know-how of the section are used to best advantage. Noise and confusion inherent in operating a net station are eliminated from the operating sections, and all stations are manned by fewer people on a 24-hour basis.

Some of the battalion's radios net into those of the assault elements of battle groups and their supporting armor. These radios provide company control, liaison with the battalion CP, and monitoring of the division's warning net. When the carrier platoons and squads are attached to the division's assault elements, their command elements can use them to control the assault forces. The company commander uses his radio to monitor his company's net and thus gains information that will enable him to plan for and conduct vehicle recovery and to promptly coordinate with the battle group staff on logistical requirements and vehicle use. When the entire company is attached to one battle group, this radio provides the group commander the communication through which he can control his forces. By attaching any size of unit of the carrier company, we add considerably to the communications capacity of the assault force.

Although the carrier company already has a great communications potential, from our experience we feel that an additional capability is required. A dummy antenna should be mounted on each carrier to permit the infantry squad to use organic radios. In this way we extend radio control of the carriers when they transport troops, as well as provide a degree of deception as to which vehicles carry key commanders. In addition, each carrier should have an intercom set for linking operator and commander.

A new resource of mobility

Thus during the past two years the Pentomic infantry division commander's five battle prongs have acquired a resource that gives them responsive and flexible mobility. This resource can not only mechanize or motorize key task forces, but provide a pool of technicians and a supplemental augmentation in firepower and communications which permits them to converge and disperse as never before. When the ducted fan and other vertical-lift devices arrive to relegate the wheel and the track to rear areas, then the three-and-a-half-miles-an-hour infantryman will be replaced by the ninety-miles-an-hour doughboy whose abilities, thus enhanced, will compensate for any superiority in numbers he may encounter on the nuclear battlefield.

THE MONTH'S CEREBRATIONS

GIVE A MEANING TO REENLISTMENT

CAPT. D. S. MEREDITH, III

"SIR, I've made up my mind. I'm going to re-up."

"That's fine, Corporal Eager. Go up to the post reenlistment office tomorrow and they'll take care of you."

So Corporal Eager reports to the poster-plastered nook near the AG's office where his reenlistment is processed with about as much ceremony as that which sends an M1 rifle to Ordnance for repair. After being sworn in by a bored personnel officer, Beaver returns to his outfit and goes back to work, harboring a hollow feeling that something is missing.

Something *is* missing.

Why do we handle reenlistments in such a cold-fish manner, and so far removed from the soldier's outfit? OK, let the AG people do the paperwork. But why not have the soldier's commander swear him back into service in his own unit? If the company or battery commander is not empowered to administer oaths, let's give him this authority, even if its use is restricted to reenlisting the people of his outfit.

To a soldier, the act of reenlisting is an important event. Usually it is the end result of a concentrated campaign by his commander and much soul-searching on the part of the soldier. The commander has retained a trained man for his unit and the soldier has embarked on—or continued—an Army career.

If the Combat Arms Regimental System is to accomplish its objective of providing the soldier a "home" unit to which his loyalty is directed, then the soldier must be made to feel that he does indeed have a military home in his outfit.

Few ceremonies could have a greater significance in cementing the loyalty of soldier to outfit than that of having the oath of enlistment administered in his unit by his commander—in the presence of his comrades. It could be done while the company is formed for a retreat parade or review. We could even arrange for a special ceremony, if that is necessary. The soldier deserves the same attention as does the civilian official being sworn into an important job and who rarely serves as long. Almost always the civilian's oath is administered by or in the presence of his new boss. Usually some of his fellow-workers are there—along with a battery of cameramen—as spectators.

In the atmosphere of the ceremony I suggest, any soldier will give a little more thought to the full meaning of the awesome oath he repeats:

". . . that I will bear true faith and allegiance to the United States of America, that I will serve them honestly and faithfully against all their enemies whomsoever, and that I will obey the orders of the President of the United States, and the orders of the officers appointed over me. . . . So help me God!"

Captain David S. Meredith, III, *Infantry, is a 1950 graduate of West Point who has served in the 82d Airborne Division, 187th Airborne RCT (FEC), and XVIII Airborne Corps headquarters. He is Assistant PMST at the University of Dayton, in Dayton, Ohio.*

WHAT GOOD IS SHOULDER INSIGNIA?

CAPT. DANIEL BLOOMFIELD, JR.

THE Combat Arms Regimental System rolls along—perhaps imperceptibly but nonetheless inexorably—toward that time when we will all be permanently assigned to one regiment or another. Through the years I have bounced, so to speak, from division to division, from regiment to regiment. I keep wondering how I managed to shift my esprit de corps about so nimbly. It was easy. I simply shed my old shoulder insignia and its built-in esprit de corps, and sewed on new insignia and its built-in esprit de corps.

I basked in the traditions of the old Umpty-umpth; then I became a proud member of the old Septeenth—until I got transferred to some other old and equally tradition-steeped outfit. At times I was slightly confused. Like when I was posted to my last outfit. It was redesignated three times in three years (a sort of annual event on Organization Day). I kept telling myself: Stay flexible, boy; tradition is very important, even if you must trade one set of traditions for a new one every two or three years. Lately, however, I've found that thought more and more difficult to accept.

When ARMY first discussed the proposed regimental system ["Old Outfits Need Not Fade Away," May 1956], happily I saw the end of this patch-switching routine. Then I realized I would still be transferred from division to division and must change shoulder insignia each time I was transferred.

One article in ARMY ["The Soldier's

Outfit is His Home," May 1957] maintained that division esprit seldom flourishes; that the soldier considers the battalion or the regiment as his home. In that year's July number the article "Doubts About the Regimental System" maintained that the average soldier, particularly when in combat, places his loyalty with his division and not his regiment. The executive officer of one regiment in which I served said he didn't care to be permanently assigned to one regiment for his entire career. He thought the whole scheme purposeless.

Are the traditions and battle honors to repose in the regiment or in the division? Regardless of the conflicting points of view, the Pentagon has decided that the regiment is the repository of tradition. Why, then, is the soldier required to sew on and then remove shoulder insignia of the various divisions, corps and even armies to which he is assigned?

During bull sessions among combat veterans of outfits like the 1st Infantry Division and the 82d and 101st Airborne, which are noted for their unusually high esprit, more often than not the talk is about experiences in regiments. The Distinguished Unit Citation, by and large, is awarded to regiments or smaller units. Few soldiers argue over the fact that allegiance to a corps or army is at best a nebulous thing. Corps and army insignia are worn not through any particular pride, but because their wearing is required. It is an entirely different matter where crests and other regimental insignia are concerned.

In the interests of rationality and consistency—and economy both to the Army and to the soldier—I suggest that AR 670-5 be amended to allow the wearing of shoulder insignia on dress blues. We wear them on all others, don't we?

Since we all wear regimental crests, regardless of our assignment, insignia of divisions, corps and armies seem superfluous. Their removal from the uniform will not only enhance its appearance, but stress loyalty to and pride in the unit the Pentagon has decided should have them—and where they have always been—the regiment.

Captain Daniel Bloomfield, Jr., Infantry, *was an enlisted man in the 10th Mountain Division in Italy during World War II, and commanded a company of the 45th Division in Korea. He is now an ROTC instructor with the Los Angeles High Schools.*

GIVE THE BATTLE GROUP A SHOWCASE

CAPT. WILLIAM M. GLASGOW, JR.

WHEN we adopted the triangularized division, the regiment, over the protests of the traditionalists, lost what General Pershing called "the showcase of the regiment"—its band. An enlarged band was authorized for each division, and that's the only unit that today rates one. The lowly company can't even boast a bugler.

Now a band would hardly fit in today's regiment of five battle groups. So why not authorize smaller musical units —drum-and-bugle corps—for each battle group?

Drum-and-bugle corps are typically American. They fit our Army much better than the German type of military band with the *oompahs* of the heavy brass booming out in front and the squeaks of reed instruments piping from the rear. A drum-and-bugle corps in the battle group would not only serve to build up unit esprit, but would do it with no additional men.

There are 26 men in each battle group, now tagged as messengers, who could double as musicians. They could be trained into a first-class showcase with little effort and almost no time lost from training. This corps could play at ceremonies instead of the canned music we hear now. We could also save money by absorbing the people released from bands, eliminate the cost of elaborate instruments, have more uniformity in musical organizations, and simplify their training.

I can hear objections now to my proposal to substitute drum-and-bugle corps for brass bands. If you think a D&B corps can't attain musical finesse, you are not up to the times. Modern bugles have valves and slides that give them the required octaves of range. They come in various sizes that provide a wide variety of instrument types. Drum-and-bugle corps can render anything a band can and not suffer from certain shortcomings of a band.

A top civilian corps like the Skokie Indianians, American Legion national champions for three consecutive years, can get off difficult compositions like our National Anthem along with the "St. Louis Blues." Of Skokie's four hours a week, two are spent at musical practice and two at marching and evolutions. It shouldn't be difficult for us to get a corps together for two hours of practice a day. Ten hours a week should be more than enough time to turn out a highly proficient group.

Twenty-six men make a well-rounded drum-and-bugle corps. Various arrangements can be tried, but a ratio of at least two bugles to each drum should be maintained. The current trend is toward less drums. The ideal would be eight drums (four tenors, one bass, two snares, and cymbalist); 16 bugles (eight sopranos, two tenors, two baritones, two French horns, two bass-baritones). The drum major and his substitute should be utility men, able to play any instrument in a pinch. Other organizations may be improvised to fit local conditions.

The several types of bugles allow a wide range in the corps' music. All instruments are of the same basic design, which makes for a better appearance than the band's variegated pieces. Drum-and-bugle corps need no scores as a band does, because their parts are simple.

Because they do not have to read music, it is not difficult to teach the men of a drum-and-bugle corps to play their instruments. National champion corps train only four hours a week, while bands devote all their time to individual practice and group rehearsal. Since the band is owned by the division, these soldiers are not available to the battle groups—not even for local ceremonies such as reveille, retreat or parades. For these we must rely on the canned music of the recorder. If each battle group had its own live music this omission could be easily rectified.

A drum-and-bugle corps can perform its evolutions much easier than a band can, because its instruments are uniform and smaller. Also, when a group of musicians are playing while moving about, the pieces must be arranged so

that the booms and squeals blend into some semblance of harmony. This effect on the ear has led to the trend toward larger bands.

The bigger the band instrument, the more it costs. While that also goes for drums and bugles, the proportionate increase is not as great. I am told that the corps' larger instruments cost only a fraction of their band counterparts. The small ones are at least a fifth cheaper. Dollar and manpower savings definitely favor the drum-and-bugle corps.

Units larger than battle group would need bigger drum-and-bugle corps. These could be formed by consolidating the corps of several battle groups, say for a division parade. The Skokie Indianians' 50-man corps has 39 buglers, nine drummers, and two drum majors.

I believe a change from bands to drum and bugles throughout the Army would effect a savings in money and men. It would result in sprightlier music, and engender higher esprit and regard for tradition among units. Let's give the battle group its own showcase.

Captain William M. Glasgow, Jr., Infantry, *was commissioned in 1945 and served with the 2d Infantry Division in Korea. He is the author of the recently published* Exhibition Drills.

CURVES OR FAST BALLS?

MAJOR JOHN T. BURKE

DURING recent years our administrators have become quite susceptible to a disease called "curvitis." A positive symptom of this affliction is an almost fanatical faith in the virtues of the familiar, bell-shaped curve of normal distribution. To the curvitis victim, the scientific properties of this curve rank in signficance with fission, fusion, jet propulsion, and electromagnetic emissions.

It is not difficult to diagnose curvitis, since the patient invariably performs a set stereotyped ritual. He automatically plots on a graph all statistical data coming to his attention. If he finds that the resulting figure looks more like a baseball diamond than a bell, he goes through still another ritual which he calls "normalizing the scores." Thus, he produces a neat, symmetrical, bell-shaped curve, whether or not the original data are really "normal."

The rampages of curvitis are particularly evident at our service schools. Here we find the "normal curve" an indispensable instrument of academic policy. This results in several interesting phenomena. A large number of high grades is never awarded, no matter how bright the students or simple the examinations. Conversely, there are never more than a few low grades, no matter how mediocre the class or difficult the subject matter! A student is never awarded a simple percentage score like 85 per cent or so many points correct out of so many possible. Rather, his score is "analyzed," "converted," "normalized," and otherwise manipulated. Eventually the student is awarded something between an **A** and a **U**, depending upon the mood of the "curve" at the moment.

Curvitis is particularly contagious in the rings and corridors of the Pentagon, to which flows a vast and continuous mass of data that require "normalizing." Here the process has become truly scientific, because of the handiness of automatic data processing systems (ADPS). These amazing black boxes can compound statistical confusion at approximately the speed of light. In the Pentagon, officer efficiency rating forms are a particularly lucrative source of data. As with student grades, the officer's overall efficiency index (OEI) is never a matter of simple points, or percentage, taken directly from the rating form. Rather, the score is totted only after the black boxes have digested the raw figures and produced "normalized" data. (This process requires several months, because while the ADPS works at the speed of light the human element in the administrative system does not.)

The impact of the curvitis epidemic is easily underestimated. For one thing, the curvitis victim gives every indication of being quite normal, except for his predilection for applying frequency distribution curves to everything in sight. Indeed, he is often a very competent statistician. He is usually well aware that application of "the curve" to very close scores spreads them out, and gives an impression of differences in grades and efficiency ratings that do not really exist. He becomes infatuated with "the curve."

Modern statistical techniques are a valuable administrative tool in today's Army. But the average officer or enlisted man, not being a statistician, harbors a strong suspicion that the ubiquitous "normal curve" jeopardizes his entire career. There is nothing quite so demoralizing as the discovery that an 80 per cent score is practically equivalent to failure; or that a minor variation on the efficiency rating form results in a drastic revision of one's OEI. No wonder the people in the field consider "normalized" scores roughly akin to palmistry, astrology, and the ouija board!

Besides its negative influence on morale, the normalizing process is symptomatic of a dangerous philosophy. It implies that quality of performance, and standards of achievement, are purely relative matters. Our Army has adopted (at least subconsciously) the notion of modern pragmatism that the group "norm" is a valid measure of success or failure. The "normal curve," with its hump of mediocrity, is a statistical extension of this philosophy.

The antidote to curvitis is inoculation with a massive dose of common sense. Why not establish standards and levels of achievement in the simple, straightforward language of points and percentages—regardless of what the "norm" happens to do? This would require that the normal curve and other statistical juggling acts be reserved for high-level analysis and long-range planning purposes.

Finally, complete immunization against curvitis could be achieved if we could develop a computer that will only "denormalize" scores!

Major John T. Burke, Armor, *a 1945 graduate of West Point, earned his Master degree in Psychology at Vanderbilt University. He has had various company commands and staff assignments in intelligence, logistics, training, and human engineering research. Major Burke is a student at the Command and General Staff College at Fort Leavenworth.*

ABSOLUTE ULTIMATE

CAPT. PAUL SANDERS

"THIS is an outstanding example of an excellent officer." Words like these or with that general thought in mind, on an efficiency report, mean that the death knell will soon sound for the careers of countless fine officers. Absurd? Certainly.

Adjectives are extremely handy things. They help us describe things and people. But like many other handy gadgets, frequently they are abused through loose usage.

Webster says *excellent* means "extremely good of its kind; first class; hence, of great worth; eminently good." Should we be ashamed of this adjective when applying it to performance of duty? I think not.

When compared to *superior*, the desirability of being referred to as *excellent* doesn't rub me the wrong way, at all. Because Webster and his countless revisers say that *superior* means "extremely excellent of its kind; far above in comparison." It seems to me that this type of adjective, when applied to a description of one's performance and abilities, should satisfy even the most discriminating. But is that enough? Apparently it is not, because we are faced with yet another superlative: *outstanding*.

To borrow from Webster again: "*Outstanding*. That which stands out; *specif*[ically]: *a*. Projecting; conspicuous. *b*. Resisting. *c*. Undischarged; uncollected or unpaid; unsettled." In view of this definition, I would much rather be referred to as *superior, excellent*, or even *satisfactory*.

Have I finished? I'm just beginning. Let's go on to the absolute ultimate: *truly outstanding*. In order to transfer the sublime to the ridiculous, please live for a moment with this analysis of a super-superlative.

Truly outstanding immediately implies—to me, at least—that the outstanding people aren't really outstanding at all. If they were really outstanding they would have been labeled *truly outstanding* as compared to the antonym, *not truly outstanding*, which the rating of *outstanding* suggests. Another possibility is that the rater is inclined to prevaricate when he classifies an officer as *outstanding* when, according to the logic I have expounded, he must really have meant the opposite of *truly outstanding*.

Once again I'll say I would rather be referred to in one of the lower-accepted classifications. For example, I don't care to be called literally *undischarged*. That implies either that my release from active service is imminent or that my plumbing is defective. To be classified as *uncollected* or *unsettled* would seem to have equally dismal connotations. To be *truly unsettled*—to belabor the point—is truly unsettling.

I believe *excellent* should be used to mean "excellent." *Superior* should be used to mean "superior." Any higher ratings are nothing more than steps toward tacking a high-priced label on a low-quality product. In other words, verbal inflation.

As adjectival ratings get higher and higher in order to describe a merely satisfactory product or performance, it won't be too surprising to see an efficiency report, describing a good, acceptable—but not superior—officer with the following verbal garbage leading the way: "This officer is the ultimate of the quintessence of *ne plus ultra*." That description is only a trifle more absurd than *truly resisting*.

Even though the present system may have to be changed, the inequities engendered by its application will be with us for a long, long time.

Captain Paul Sanders, Armor, *served with the 102d Infantry Division during World War II and was integrated into the Regular Army in 1949. He is now with the G3 Section, U. S. Army Armor Center.*

HOW FAR DOES PERSONAL LIBERTY GO?

COLONEL S. M. HOGAN

THE commission of every officer of the armed forces of the United States proclaims that the President reposes "special trust and confidence in [his] patriotism, valor, fidelity and abilities."

The Uniform Code of Military Justice (Article 31 *b*) has this breathtaker: "No person subject to this chapter may interrogate, or request any statement from, an accused or a person suspected of an offense without first informing him of the nature of the accusation and advising him that he does not have to make any statement regarding the offense of which he is accused or suspected and that any statement made by him may be used as evidence against him in a trial by court-martial."

Farther on, paragraph 33 *h* warns that "When any offense charged is not of a purely military nature [the officer exercising court-martial jurisdiction over the accused] should take into account that the fact that the retention in the armed forces of thieves and persons guilty of moral turpitude injuriously reflects upon the good name of the military service and its self-respecting personnel."

Whether you call these statements paradoxical or anomalous, the end result is that the protective cloak placed around the rights of persons by federal courts has been extended to include military personnel by UCMJ and by subsequent decisions of the Court of Military Appeals. (For a statement of some recent and interesting rulings by CMA, I refer you to the article by Major General Stanley W. Jones in the July issue of ARMY.)

Do the President's "special trust and confidence" remain when an officer evades punishment for a crime by invoking Article 31 of UCMJ? Do trust and confidence continue after an officer has been tried and convicted of a serious crime, but review or appellate agencies find the sentence may not be upheld because of some procedural error? Is the character of the accused officer purified by the fact that no search warrant was issued, or that he was not properly advised of his rights, or because the law officer erred in instructing the court, or because counsel's conduct is considered improper?

Of course, sometimes it is possible

to hold a rehearing in order to properly convict an accused; but I am disturbed by the case where for some reason this cannot be done.

It's a waste of time to discuss the desirability of extending the guarantee of personal liberty to the military. The decision has been rendered, but a vital question remains: How to live with the decision yet maintain an officer corps free of those who have demonstrated before a court-martial or an investigating officer that they lack integrity?

Obviously, under our Constitution any officer has the right to claim protection by the courts. However, having done so, he cannot justifiably complain if by an act of his own his commission is vitiated. An aggressive and zealous commander can probably find grounds for separating such an officer in AR 635-105A (2 January 1957). Such commanders seldom encounter insurmountable obstacles. I think, however, that the AR should be amended to fit the need of the average commander.

We should have a regulation which permits speedy separation of any officer who declines to reply on grounds of self-incrimination, or whose guilt of an offense involving moral turpitude is established but who cannot be tried because of a technical defect in the evidence or whose conviction is set aside because of such a defect.

Colonel Samuel M. Hogan, Armor, *commanded a tank battalion in the 3d Armored Division during World War II. Since then he has been staff judge advocate of one armored division and chief of staff of another, and is now on duty in the Pentagon.*

RECOGNITION OF THE PROFESSIONALISM OF THE CAREER NON-REGULAR

CAPTAIN JOHN W. CLARE

WHY must today's non-Regular career officer carry the meaningless tag of *reserve officer* while on active duty? The Army Reserve and National Guard officer with an indefinite commitment is as dedicated and as professional-minded as his Regular brother, so there is really no difference in individual missions. All are part of our main striking force. In the event of war, all will immediately move toward the sound of the guns.

I believe we need a new designation for non-Regular career officers—one that will carry more prestige, promote higher morale, and establish a definite line between this professional group and the true reservist. I use the term "true reservist" not in disparagement but merely to identify an officer of the Ready Reserve or Standby Reserve. Being closely associated with him in my job, I have only the highest regard and utmost respect for the USAR officer. He and I belong to the same component. I teach, advise, and suggest to him. However, he has had, on the average, four years of active service during World War II, while I have put in fifteen. Frankly, on a comparative basis, I think I can be called a professional, and prefer that over any other label.

Once a reserve officer agrees to remain on active duty by accepting an indefinite commitment, he should be changed immediately from a reserve to a professional status. To distinguish the active-duty reservist from what I call the true reservist, his component should be changed from USAR to Active Army, Career Army, Associate Regular Army, or something similar. I offer these merely as a starter.

I firmly believe greater over-all efficiency would result simply by giving today's career reserve officer professional recognition. If 20 years in the Active Army don't mark an officer or enlisted man as a professional soldier, I don't know what would. I advocate no drastic changes in those laws and regulations that apply to the active-duty reserve officer. I ask only that we recognize him for what he really is: a professional soldier.

If the redesignation I suggest were implemented, our officer corps would include these separate components: Regular Army, Active Army (for example), Army Reserve, and National Guard. During wartime another component—Army of the United States—would be added, for officers coming in after a certain date. However, the Active Army component would retain its distinctive designation, and so would the others.

This department is designed to accommodate the short, pithy and good humored expression of ideas—radical and reactionary, new and old. We pay for all contributions published but you deserve to be put on notice that the rate of payment depends upon the originality of the subject and the quality of writing rather than length. This department is hungry for contributions, so shoot that good idea in . . . today.

True, the creation of a new component will solve no serious difficulties except for the non-regular professional, on whom the tag "reserve officer" connotes neither fish nor fowl. Besides, there is always the frustration connected with trying to explain one's status to an uninformed civilian. No, I am not in the Regular Army; I'm a reserve officer. I was commissioned from OCS, in the Army Reserve. Yes, I *am* with the Active Army, even though I am a reserve officer at the same time. No, I am not a professional reservist in the Regular Army. I am the Active Army's advisor to Army Reserve units here, even though I'm a reserve officer.

The attempt to explain one's standing in the Army can get wearisome at times. I am certain other non-regular career officers have gone through the experience.

How much trouble would develop if we created a new component? How much would it cost? Would it require Congressional action? Could it be done through a simple DA circular or AR? Don't ask me! I only offered the suggestion. I know, however, that professional recognition of this loyal, dedicated group of non-Regulars would be a tremendous shot in the arm both for them and the Army.

Captain John W. Clare, Infantry, *served in Iceland and in the South Pacific during World War II, in Korea during 1951, and later in battalion to post staff positions. He is now Reserve Center Coordinator and Unit Advisor to the USAR in the Traverse City, Michigan, area.*

THE MONTH'S BOOKS

Rockets, Moon and Space

ROCKET TO THE MOON
By Erik Bergaust and Seabrook Hull
D. Van Nostrand Company, 1958
270 Pages; Illustrated; $5.95
ROCKETRY AND SPACE EXPLORATION
By Andrew G. Haley
D. Van Nostrand Company, 1958
334 Pages; Illustrated; Index; $6.75

Reviewed by
MAJOR PATRICK W. POWERS, Artillery, *author of many articles on guided missiles, who is on duty in the Office of the Chief of Research & Development, Department of the Army.*

In the ionized (and agonized) wake of *Lunik*, many more books on space travel will be written, but here are two that will readily orbit reader interest. The first is a fascinating story of the moon and the technological race to reach it. There is also a surprisingly strong stand taken on the lack of a forceful U. S. program in space—a most current subject. The second, *Rocketry and Space Exploration*, covers in documentary style all the broad areas of rocket history, technology, space exploration, and international aspects of the field of astronautics.

Rocket to the Moon accelerates smoothly from the general reasons for man's desire for space exploration to the critical region of the meaning of the USSR-U. S. military and scientific race to space. The moon is interestingly analyzed by fact and fiction and then the reader takes off in a believable moon rocket, *Luna I*. Though this touches on science-fiction, it is a realistic moon trip based on what we already know about such a voyage and the effects on man and space ship. A later chapter describes landing on the moon and the problems of living and exploring the treacherous terrain from both a military and a scientific standpoint. Of course, allied to this are discussions of the composition of space, new types of propulsion, solar energy, and excellent information about astronomy.

The authors bring up many pertinent questions on the military importance of the moon. For example, is the moon "high ground" from which to control military operations on Earth? They say it is, but there is no reasonable evidence of just how any control *can* or *will* be exercised. The comparison of moonland to the Antarctic seems to be a valid one, and the military, economic, and political worth may be just about the same. Another factor that tempers any large-scale space program is the tremendous cost of space exploration. Will we ever see "colonies" on the moon when just a few lunar probes already have strained our current national budget? Recovering from this line of thought, the authors "return to Earth" with one of the best authentic descriptions of a Cape Canaveral countdown this reviewer has read. More than anything else, the countdown serves to dramatically illustrate the awesome complexity of "man's greatest venture," and incidentally, what we are up against in our long-range missile programs.

Rocketry and Space Exploration endeavors to embrace too much of the rocket and missile business by lightly sketching the entire spectrum. Its significant contribution is a treatment of the progress of scientific, industrial, and technical organizations in most of the countries of the world since the 1930s. The author, Mr. Haley, participated in this progress through a surprisingly large number of these organizations both in the U. S. and abroad and so is certainly competent to give this historical documentation.

Both books are written in clear, nontechnical language by experienced, competent men in the rocket field. *Rocket to the Moon* is especially recommended to the military reader as a storehouse of lunar material with a slant toward the great issue of the times: the technological race with the USSR. On the other hand, *Rocketry and Space Exploration* fills the need of any library for a general text on rocketry and the history of astronautics.

Social Effects of Nuclear Attack

THE SOCIAL IMPACT OF BOMB DESTRUCTION
By Fred Charles Iklé
University of Oklahoma Press
250 Pages; Illustrated; Index; $3.95

Reviewed by
STEFAN T. POSSONY, *member of the faculty of Georgetown University and Foreign Policy Research Institute, and author of* Strategic Air Power *(1949).*

Dr. Iklé, one of RAND Corporation's stable of social scientists, has both the linguistic and mathematical skill to undertake his task. He should be congratulated on his courage, for this was a rocky field to plough. He knows better than any of his readers and reviewers that in the absence of real evidence—which, thank God, is not yet available—no reliable conclusions can be formulated.

The author starts from the premise that the social and not the physical effects of bombing are of ultimate importance for the conduct and outcome of war. In order to elucidate those impacts, he studied the social consequences of destruction of resources, such as consumer goods, food and housing; the extent and significance of casualties; the techniques, problems and diverse influences of evacuation and dispersal; the difficulties connected with transportation in countries under bombardment; the interrelationships between labor-force needs, loss of manpower, destruction of machinery, repair and production; and the cumulative effects of bombing, which are the real crux of the matter. These effects are investigated on local, regional and national levels, and for short as well as long campaigns. They are related to the capability of the armed forces to survive and retain combat proficiency, to the overall administrative organization of the nation, and to the government's continuing decision-making ability. He concludes with a discussion of the feasibility of "broken-back" war and of postwar reconstruction.

Dr. Iklé uses whatever documentation is available outside the Soviet Union. He employs quantitative methods so far as they could be fitted into his analysis, he has probed into the qualitative aspects and he has not vitiated his investigations by "simplifying" assumptions. He recognizes that the impact of bombing depends on weight and frequency of attack, and duration of the conflict. Obviously, there must be a point where this impact would be overpowering.

In general, Dr. Iklé inclines to be guardedly optimistic, in the sense that he believes methods can be devised by which a society under nuclear bombardment may be kept more or less intact, albeit with a great deal of suffering. His book is a convincing answer to the apocalyptic writers who wax so lyrical about "nuclear extinction" and incessantly whip up emotions of despondency, despair and defeatism. The vision of utter hopelessness leads to inaction and causes failure to take those protective measures which could reduce the social impact of nuclear war, including destruction of resources, casualties and demographic damage. Although he leaves no doubt about the horrors of nuclear war,

the author disproves those who contend that surrender would be a choice preferable to resistance.

Dr. Iklé's work must be studied on several levels. First, he describes what happened during World War II, in terms of the social consequences of bombing. In particular, he shows that there were partial "compensations" for the destruction of many types of resources. He analyzes evacuation and other means of protection as they affected manpower, morale, and motivation. "Partial destruction of cities, such as occurred in World War II, does not lead to a loss in war production commensurate with the loss of property. As long as the number of casualties is slight, recuperation and increased utilization of the remaining resources can keep the losses in current war production much smaller than the losses in industrial capital." He believes that "very large destruction combined with large casualties, such as might be caused by nuclear bombing, would probably bring industrial production almost to a standstill, but it would not by itself lead to termination of the war unless one belligerent should escape this destruction. . . . Repeated attacks could inhibit the kind of political action that is the prerequisite for the termination of war."

The book is a very useful compendium for evaluating protective measures. It becomes quite clear that a large-scale shelter program is an indispensable part of rational preparedness. Shelters are not the whole answer, but they would go a long way toward keeping casualties within "reasonable" bounds. Dr. Iklé shows that evacuation and dispersal have undoubted merits in a war of a scope more limited than thermonuclear war waged with weapons of extremely high yields, but these methods would have a useful place in such a total conflict. More important even than providing for protective physical facilities would be the availability of services ranging from medical aid via food reserves to temporary housing and moral succor. Dr. Iklé discusses these problems to some extent by implication, but it becomes clear that the improvisation of protection which scored some success during the last war, would be unsatisfactory in the face of a nuclear threat. This is particularly true with respect to government. The functioning of government in the midst of urban ruins, broken-down transportation, and disrupted communications, cannot be assured without thorough preplanning—planning in the sense of action, not just the writing and coordinating of plans.

Dr. Iklé comes forth with a very useful discussion of "broken-back" war. He proves, rather conclusively to my mind, that such a war, which is usually dismissed as impossible, would be quite practical. This is so because the armed forces may well preserve operational capabilities after the nuclear "exchange" and because the situation may be such that no surrender could be offered or implemented. (Also, in a chaotic situation no one is likely to give up his weapons voluntarily.) The author shows that, contrary to common expectation, such a war cannot, on the whole, be waged except through nuclear weapons: there would be no capability to fight with weapons systems requiring substantial logistics. If Iklé is right—and I agree wholeheartedly—then the concepts on which our security preparations are based are as yet incomplete.

A nuclear war will not be fought in a political-historical vacuum; it is likely that one or another Communist power will be among the belligerents. Consequently, it would have been useful to study the interrelations between their conflict doctrine and the facts adduced by the author. Conversely, it would have been of great interest to learn how the Soviets think *they* may be able to mitigate the social impact of nuclear war waged against them, especially since many Communist experiences are extremely pertinent to the problem.

In the same vein, the author fails to discuss the possible results of bombardment of multinational populations. Presumably, social impact of nuclear attack varies with the degree of social cohesion obtaining before hostilities. A homogeneous population under a government whose legitimacy is unquestioned should be far more resilient, and socio-politically and culturally far less vulnerable, than one consisting of numerous mutually antagonistic nationalities—some of which are longing for independence—and which is ruled by a despotic government whose legitimacy is not generally accepted.

Those are some of the factors which would indicate that the risks of nuclear war are considerably greater for dictatorial Communist empires than for democratic nation-states, even granting that democracies tend to be more loosely organized than dictatorships. Dictatorships cannot survive the moral or physical destruction of their apparatus of repression; democracies have a good chance even under extreme stress, to carry on cooperatively, without coercion. The author should have thrown some light on the question.

It is deplorable that today a book on a subject of such overwhelming importance can be written without fully taking into account Communist theories, practices, intentions, capabilities, and vulnerabilities. This reviewer never will understand why it is so difficult for our academic souls to poke their noses into Communist writings, and keep them there for a while instead of pulling back in fast disgust. Surely scientists must familiarize themselves with concepts and experiences that really count in the context of their problem. To write about conflict and ignore the opponent—if there is a better formula for living in an ivory tower, I am not aware of it.

I think this is a very serious criticism of Dr. Iklé's work. However, his book should be praised for what it contains and not be rejected for its omissions. He has made an extremely valuable, pioneering contribution. It is to be hoped that his findings will be studied carefully throughout the Defense community. But now, the explorer must follow the pioneer. Let us hope Dr. Iklé does not tire of the task.

Frontier Fighting Army

FRONTIER STEEL: The Men and Their Weapons
By Waldo E. Rosebush
C. C. Nelson Publishing Company, 1958
355 Pages; Illustrated; Maps; Index; $6.25

Reviewed by
WILLIAM V. SCHAFER, *an Associate Editor of* ARMY, *member of the Civil War Round Table and American Military Institute, and small-arms collector.*

There will always be an "Old Army," and *Frontier Steel* tells the story of one of the best of them—that "Old Army" which fought the Mexican War and the Indian campaigns in the Pacific Northwest up to very nearly the beginning of the Civil War. The subtitle aptly covers the contents, for it is the history of a frontier fighting Army and the guns that won the West, a combination that could not be beaten.

Book 1 covers the Mexican War in all its gore and glory, its triumph and its incredible hardship. If it has a hero, it probably is the 1st U. S. Dragoons, the thread of whose 28-year history (1833-61) runs through the chronology of those exciting years. But there are other heroes besides the splendid, disciplined Regulars, and these bravos are what we nowadays refer to as "characters."

There were hairy-chested, rakehell Volunteer outfits like the Regiment of Mounted Riflemen, the Texas Rangers, and Doniphan's Missourians. The Rangers were headed by men like Samuel Hamilton Walker, later killed at Huamantla, Mexico, who was instrumental in the development of the Colt-Walker-Whitneyville revolver.

The savage nature of the campaigns in Mexico and the virile quality of the author's writing shows in a typical passage describing Doniphan's Missourians in their fight at the Sacramento River above Chihuahua—some 850 Americans against about 4,000 Mexicans: "A few wild minutes finished the job. The missourians used clubbed muskets, sabers, stones, fists and very violent words. The gore and glory of those few minutes would stay with them for a lifetime. Some Mexicans were said to have run the entire fifteen miles to Chihuahua. They certainly had every incentive. Chased by a bunch

Selected Check List of the Month's Books

This run-down of some of the books received for review during the month preceding our deadline is to give our readers who like to follow current literature a monthly check list of the most important, useful and potentially popular books. Full reviews of some of these books may appear in this or subsequent issues. Any of these titles may be purchased through the Combat Forces Book Service.

AIRCRAFT ENGINES OF THE WORLD, 1958-59. By Paul H. Wilkinson. 320 Pages; Illustrated; Index; $15.00. The latest about gas turbines and reciprocating engines, with much pertinent information about the aircraft in which they are used. Data are in English and metric. There are also sections on specialized power plants, nuclear aircraft engines, accessories and equipment, fuels and lubricants, and up-to-date tabulations of aircraft and their engines.

COMMUNICABLE DISEASES Transmitted Chiefly through Respiratory and Alimentary Tracts. Col. John Boyd Coates, Dr. Ebbe Curtis Hoff and Phebe M. Hoff. Government Printing Office, 1959. 544 Pages; Illustrated; Index $5.50. This latest volume in the Army's medical history of WWII is almost entirely technical. The combat leader who needs a reminder of the operational importance of infectious disease can get it in the first 24 of the introductory pages.

GI'S VIEW OF WORLD WAR II. By Ben Tumey. Exposition Press, 1959. 64 Pages; $2.50. Aspects of WWII as recorded by a Field Artilleryman of the 79th Division.

THE WAR AGAINST JAPAN; Vol. II: India's Most Dangerous Hour. By Maj. Gen. S. Woodburn Kirby and others. British Information Services, 1959. 541 Pages; Illustrated; Maps; Index; $10.22. This latest volume in the British official history begins with the loss of Burma and the retreat into India. How the recovery of Burma was handicapped by lack of matériel, the need for time to train the Indian Army, formation of long-range penetration forces, Wingate's first campaign, and the causes of failure of the Arakan campaign.

A REBEL'S RECOLLECTIONS. By George Cary Eggleston. Indiana University Press, 1959. 187 Pages; $3.75. Life in Virginia before the war, men of the Confederate Army, the easy-money period and the aftermath, and vivid descriptions of Lee, Jackson and Stuart. First published in 18-74, the new introduction by David Donald draws upon hitherto unpublished Eggleston manuscripts.

RIBBON CREEK: The Marine Corps on Trial. By Brig. Gen. William B. McKean, USMC, retired. The Dial Press, 1958. 534 Pages; Maps; $5.00. The whole story of the Parris Island affair. General McKean, CG at Parris Island at the time, relates the whole story of the tragedy, and the court-martial. Analyzes the Marine Corps training system, tells how DIs are selected and trained, and comments on the human material they work with. Much advice here for those who conduct basic training.

SEVEN ROADS TO MOSCOW. By Lt. Col. W. C. F. Jackson. Philosophical Library, 1959. 334 Pages; Maps; Index; $7.50. The invasions of Russia from the Vikings to Hitler. The author taught at the Camberley Staff College, and at the Sandhurst Royal Military Academy. A fine military study, with good maps.

THE SOVIET NAVY. Edited by Comdr. M. G. Saunders, RN. Frederick A. Praeger, 1959. 340 Pages; Illustrated; Index; $7.50. Authorities from 11 countries cover every aspect of Soviet naval affairs: forces, bases, personnel, and effectiveness. The strategic, geopolitical and technological implications are important to any understanding of East-West relations. There are chapters by our own Hanson W. Baldwin and Rear Adm. E. M. Eller.

STUKA PILOT. By Hans Ulrich Rudel. Ballantine Books, 1958. 230 Pages; Illustrated; Paper, $.50. The air war against the Russians. With 2,530 operational flights, Rudel was Germany's leading wartime pilot.

WHAT HAPPENED AT PEARL HARBOR? Edited by Hans Louis Trefousse. Twayne Publishers, 1958. 324 Pages; Index; $6.00. A collection of the most pertinent documents concerning the attack, assembled into sections covering events at Pearl, Washington, Tokyo, Berlin, and U. S.-Japanese diplomatic conversations and messages.

THE YEARS OF THE SKY KINGS. By Arch Whitehouse. Doubleday & Company, 1959. 336 Pages; Illustrated; Index; $4.95. The planes of WWI and the men who fought them: Richthofen, Fonck, Rickenbacker, Ball, Guynemer, Mannock, Bishop, Luke, and the rest. The author was one among them.

of gaunt, toothy, blackbearded, wildeyed madmen clad in buckskins and civilized remnants, rushing like a tornado close behind with bloody cleavers waving . . . it took little discretion to turn tail from an Attilic mob like that."

The Mexican War was crucible in which were molded "men of steel and the steel they carried." Here are found names that ring like a bugle throughout the Civil War: R. E. Lee, Jefferson Davis, Thomas, Hardee, Garnett, Jeb Stuart, Bragg, Longstreet, Pickett. They all were there, and it makes interesting retelling.

The second section embraces the Indian wars of the Northwest and dispels the oft-held notion that the Indians of those regions were any less warlike or less adept in their form of fighting than those of the Plains and the Southwest in later campaigns. Here the Army on the frontier first entered into a role that was to become familiar: that of arbiter between red man and white. And this in the face of the prevalent frontier settler's viewpoint: "Why should a few thousand Indians prevent millions of whites from finding homes?"

So it went: White encroachments, Indian attacks, Army reprisals. For the Army it meant (Book I, Chapter XIX) "Little Fights But Always Losses."

Rosebush's book is excitingly written, exhaustively researched, and thoroughly documented; there are 20 pages of notes and 28 of appendixes alone. The author has done a handsome job on the men and guns that won the West.

Understanding Communism

WHAT WE MUST KNOW ABOUT COMMUNISM
By Harry and Bonaro Overstreet
W. W. Norton & Company, 1958
348 Pages; Index; $3.95

Reviewed by
COL. CHARLES A. H. THOMSON, Infantry, USAR, *former member of AUSA's Executive Council, now on the staff of the Brookings Institution, who has reviewed many books for* ARMY.

Harry and Bonaro Overstreet, known to millions as interpreters of "the mind alive," wrote this book about communism because they "had to." As individuals, they could no longer ignore the threat to the world implicit in the Communist drive for world domination. So they laid tribute on the best experts and research institutions to help them to their own understanding, and reported the results clearly and briefly so all might share.

Not surprisingly, there are no new ideas or facts in this book. The authors have pulled out of the confusing welter a convincing and sound interpretation of communism in the modern world. They pass in review the beginnings and developments of communism abroad. They describe the structure and tactics of the party in our midst. They put sharply the stakes for which the Communists and the free world are playing.

No reader will miss the point that Communists have been working toward their goals unswervingly, and are not about to change either their tactics or their targets, despite short-run appearance.

Khrushchev carries on Stalin's imperialist drive, dallying with "collective leadership" because he is not yet in position to purge all his enemies. The CPUSA pursues a "voluntary" devotion to the Moscow line with slavish accuracy, no matter who is local chief. The party at home and abroad is interested in injustice not to rectify it, but to make it the occasion of party propaganda. Workers, Negroes, youth, the intellectuals, and

the armed forces remain prime targets for penetration. (The material on armed forces is regrettably short; the analysis of the appeal of the party to intellectuals is especially sharp.) The Soviet Union has practiced six kinds of imperialism for forty years, and is now learning and applying a seventh: trade imperialism or economic warfare.

The best chapter deals with Communist tactics in negotiating. Following Leites and Joy, the Overstreets make clear what the Communists are trying to do when they come to the greeen-cloth table: to gain information, to drive bargains, to make propaganda, to improve their position for carrying on the unending warfare with the capitalist enemy—and to ward off the danger of being influenced in the meantime. (Being influenced means to be under someone else's control. No totalitarian can take that from outside.) And they stress what Americans need to remember as Dulles goes from parley to parley: Communists respect and retreat from strength. Americans will only undercut their negotiators and weaken the free world's position if they put unrealistic demands on them, calling for things that cannot be gained, demanding results that cannot be wrung from Communist intransigence, hoping to relax tensions when Communists have no idea of doing so unless to the free world's harm.

In their closing chapter the Overstreets compare the world view of the Communists and the true democrats. A Communist victory would mean freezing mankind at a level of development far short of maturity, by enforcing the export of Soviet provincialism. A democratic victory means an inclusive victory for the cosmopolitan development of the hopes and potentialities of all mankind.

If military people, from recruit to general, are in any doubt about the duration or the stakes of the anti-Communist struggle, let them find the answers, powerfully stated, in this book.

Hard-Bitten Espionage

ALLIED INTELLIGENCE BUREAU
By Col. Allison Ind
David McKay Company, 1958
305 Pages; Index; $4.95

Reviewed by
LT. COL. ROBERT B. RIGG, Armor, *author of* War—1974, Red China's Fighting Hordes, *and a former intelligence officer with experience in the European and China theaters during World War II.*

Authoritative books on espionage and military intelligence are rare. Reason: most intelligence officers and agents are not yet allowed to tell their stories.

Here is a rare exception: an intriguing narrative that puts military espionage into its realistic realm of blood and death—not champagne and bedrooms. Jungle-hidden, Japanese- and disease-ridden, Allied G2 agents led triple lives and in triple jeopardy. Pacific Ocean radio operators, sweating out their hidden teams, picked up such messages as these: "Murphy . . . ambushed . . . captured. Carlson and Barrett killed. Consider codes . . . other vital coast watchers information compromised."

Spymaster and author, Colonel Ind relates later: "It would be after the war that I would follow the court-martial . . . of a recovered if torture-scarred Captain J. J. Murphy, who confronted his one time Japanese accuser and fully cleared his name. He had not talked. And the dead could not talk; they were Lieutenant F. A. Barrett . . . and Sergeant L. T. W. Carlson."

His stories of such men are myriad—men who risked and gave their lives to bring in Allied air and ground attacks because they were daring enough to live and spy within the range of enemy guns. Colonel Ind's book is a catalog of unsung heroes—men who spied out ahead of the Allied island-hopping campaigns from New Guinea and the Solomons to the Philippines.

One of the most effective groups of spies during World War II was the train watchers in German territory. Here are the documented tales of the coast watchers—a term that first achieved fame in the fictional *Tales of the South Pacific*. Here is a gripping account of General MacArthur's intelligence operations by an officer who could tell even more. What he has told he has done well, though the reader would like an over-all summary of the total military impact. This, for reasons unexplained, is denied. But here is a book by an officer who knows intelligence first-hand and who has shared its hazards. If you don't read it, you'll see portions of it on TV in many years to come. Heroism and hardship and Oriental suspense and danger, this is the story of many lonesome men who brought bombs and bullets down on the enemy by virtue of their daring and skill.

Round Trip to Moscow

NAPOLEON'S RUSSIAN CAMPAIGN
By Count Philippe-Paul de Ségur
Houghton, Mifflin Company, 1958
306 Pages; Maps; Index; $5.00

Reviewed by
BRIG. GEN. JAMES D. HITTLE, USMC, Retired, *long-time student of the history and development of general staff systems and author of a book on the subject.*

By the latter part of June 1812, Napoleon was ready. From the Guadalquivir and the shores of Calabria to the banks of the Vistula 617,000 men were poised. Napoleon made his final reconnaissance of the front lines and gave the order to advance. Thus began one of the boldest and most disastrous grand-scale operations in all military history. A winter, a round trip to Moscow, and a half year later this army—frozen, bled and withered—was retreating back across the frontier, totaling only 6,500, and these barely able to use their weapons.

The story of the ill-fated Russian campaign has since been a worthwhile object of military study and speculation. Unfortunately, reliable source material and eyewitness accounts are scarce.

Ségur's book constitutes a highly valuable addition to eyewitness accounts of Napoleon's ill-fated invasion of Russia, and takes its place alongside General Caulaincourt's *With Napoleon in Russia* as a primary text on that campaign. The value of Ségur's writing stems largely from the characteristics of the author himself. It was in his capacity as a general and aide-de-camp to the Emperor that he participated in the Russian campaign. He was an experienced officer, having worked his way up through the promotion grades since entering the French Army in 1799. In addition, his style of writing is of high quality—simple, expressive and highly perceptive. As a result, his book offers a rare and intimate account of the little known but intensely important aspects of that disastrous operation. While Caulaincourt focused his memoirs primarily on Napoleon, Ségur emphasizes staff, operations and leadership. The two books complement rather than duplicate each other.

Professional military readers will find much of interest in Ségur's observations relating to staff planning and supervision of operations by key personnel at Napoleon's headquarters.

Napoleon's Russian Campaign fully ranks with the military classics.

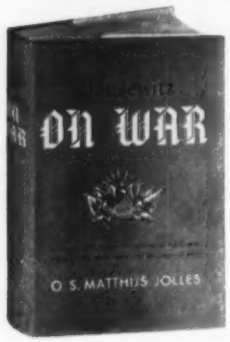
Lee's Greatest Battle

CHANCELLORSVILLE: Lee's Greatest Battle
By Maj. Gen. Edward J. Stackpole
The Stackpole Company, 1958
384 Pages; Illustrated; Maps; Index; $5.75

Reviewed by
BRIG. GEN. DONALD ARMSTRONG, USA, Retired, *who reviewed other volumes in this series.*

The letter written by President Lincoln to Major General Hooker on 26 January 1863 is fortunately printed in full in this book; "fortunately" because later events proved how justifiable were Lincoln's misgivings about the character of his new commander of the Army of the Potomac. The letter is a key to the defects that were even more serious and more injurious to the success of the Army of the Potomac than Lincoln guessed.

Clausewitz . . .



ON WAR

TRANSLATED BY

O. S. MATTHIJS JOLLES

No military student is educated, no officer is competent for higher command or staff duties, until he has read and re-read *On War*.

Tactics change, often from year to year; strategic concepts must be redeveloped in light of new weapons and defenses against them. But the meaning and the purposes of war are unchanged and unchanging.

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COMBAT FORCES BOOK SERVICE

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Hooker's defeat at Chancellorsville, more the consequence of weakness of character than lack of military skill, proves the wisdom of an ancient Grecian custom. In Athens of twenty-five hundred years ago, ten *strategos*, or generals, were elected each year to lead the armed forces. To enter on their duties they had to pass only one test: an examination of character. Would Hooker have passed his test?

Most certainly not, according to General Stackpole, who is a one-man court of inquiry on General Hooker's conduct of the Chancellorsville campaign. And in his earlier books on Gettysburg and Fredericksburg, Stackpole has proved to be a competent judge of the military strategy and tactics of our Civil War, and an able and impartial reporter of the facts. He tells the story from the point of view of an Olympian observer who believes in equal time and space for both parties.

Chancellorsville lives up to the standard set by his first two books. This battle in the Wilderness west of Fredericksburg is a challenge to the historian who has to describe a most complicated maneuver without oversimplifying it. This General Stackpole has accomplished in a clear and well-organized narrative, immensely aided by thirty of the best campaign and battle maps that have been published for many a day. It is easy to follow and understand the strategic moves, and the shift in positions that are called "Chancellorsville."

Now it is clear, as General Stackpole emphasizes, that Hooker's strategic plan was excellent in its main outline—except for the use of his cavalry. His success in surprising Lee by getting three corps on his flank and rear must be a plus sign on his record. But the outflanker was outflanked by Jackson's famous march across his front. Hooker's excellently conceived nutcracker technique had no nutcracker suite. No general in history ever proved more persuasively than Hooker in this campaign Field Marshal Earl Wavell's contention that tactics is a more difficult and important part of generalship than strategy.

Hooker's performance as commander of the Army of the Potomac in this battle is pitilessly examined under the microscopic eye of the author, who contrasts Hooker and Lee in a valuable analysis of character and procedures. No wonder he subtitles the book "Lee's Greatest Battle." It was Hooker's first and last battle as an army commander, and in what he did and failed to do there is a warning to all future military leaders.

Chancellorsville convinced Lincoln that he must add Hooker's name to the melancholy roster of generals who had to report "mission not accomplished." McDowell, McClellan, Pope and Burnside found in Hooker a fifth companion in the found-wanting group, and Lincoln continued his search for a general who could defeat Robert E. Lee. General Stackpole's analysis of this campaign is an excellent study of how and why Hooker's leadership ended in disaster.

Perils of Amateur Tactics

THE BATTLE OF BALLS BLUFF
By Maj. Gen. Joseph Dorst Patch, USA, Rtd.
Potomac Press, 1958
123 Pages; Illustrated; Maps; Index; Cloth $5.00, Paper $3.50

Reviewed by

N. J. ANTHONY, *an Associate Editor of* ARMY, *who has done considerable research on the Civil War.*

In the fall of 1861 McClellan sent Brig. Gen. Charles P. Stone's division of three brigades to Poolesville, Maryland, some twenty miles northwest of Washington, to keep an eye on the Potomac crossings. Another division was already at Dranesville, Virginia, observing Brig. Gen. Nathan G. Evans's Confederate force at Leesburg. Stone was directed to make a demonstration in hopes of forcing Evans to move. He turned the job over to Col. Edward D. Baker, late U. S. Senator and close friend of Lincoln, who had commissioned him.

Balls Bluff—a steep slope almost a hundred feet high—a short distance north of Leesburg, was the spot Baker chose for the assault by his brigade of four regiments. To reach Evans's force the Union infantry had to cross the river and scale the bluff. The wonder is that the Confederates allowed them to land. Arrived on the Virginia side with no plan, Baker made no attempt to seize the ground commanding the battlefield, advancing against an enemy centrally posted within a couple of miles of each of two existing ferries. Disaster resulted when the Confederates enveloped both flanks and the Union force was trapped with the river at its back. Of the U. S. force, 49 (including Baker) were killed, 158 wounded, and 714 captured or missing—about half the entire force—against the CSA loss of 33 killed, 115 wounded and one missing out of about 1,700.

Strategically the action was unimportant, occurring while the Federals were still disorganized by their defeat at Bull Run and the Confederates by their success. General Dorst, a veteran doughboy who lives near the battle site, in his critique details the errors and places the blame where it belongs—principally on the unfortunate Baker. Most of his book is taken up by after-action reports and contemporary newspaper accounts. His narrative, while short, points up the perils of amateur tactics, and shows what can happen when lions are led by donkeys.

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The Association of the U. S. Army shall be an organization wherein all who are in accord with its objectives may join in the exchange of ideas and information on military matters, and in fostering, supporting, and advocating the legitimate and proper role of the Army of the United States and of all its elements, branches, and components in providing for and assuring the Nation's military security.

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Rep. Edward T. Miller, Washington, D. C.; **Chap. (Maj. Gen.) Luther D. Miller**, Washington, D. C.; **Brig. Gen. de Lesseps S. Morrison**, New Orleans, La.; **Maj. Gen. Kenneth D. Nichols**, Washington, D. C.; **Maj. Gen. George Olmsted**, Washington, D. C.; **Frank Pace, Jr.**, New York, N. Y.; **William S. Paley**, New York, N. Y.; **Howard C. Petersen**, Philadelphia, Pa.; **Brig. Gen. Wendell C. Phillippi**, Indianapolis, Ind.

Sen. Charles E. Potter, Washington, D. C.; **Mark E. Putnam**, Midland, Mich.; **Ogden R. Reid**, New York, N. Y.; **Gen. M. B. Ridgway**, Pittsburgh, Pa.; **Willard F. Rockwell**, Pittsburgh, Pa.; **Maj. Gen. Harry McK. Roper**, Washington, D. C.; **Dean Rusk**, New York, N. Y.; **Maj. Gen. Charles E. Saltzman**, New York, N. Y.; **Rep. Robert Sikes**, Washington, D. C.

Sherrod E. Skinner, Detroit, Mich.; **Charles M. Spofford**, New York, N. Y.; **Rep. Olin E. Teague**, Washington, D. C.; **Dr. Charles A. H. Thomson**, Washington, D. C.; **Sen. Strom Thurmond**, Washington, D. C.; **Lt. Col. Jack Warner, Jr.**, Burbank, Calif.; **Brig. Gen. Robert E. Wood**, Chicago, Ill.; **Ben H. Wooten**, Dallas, Tex.

CHAPTERS

AUGUSTA AREA CHAPTER—Chapter awarded most-valuable-player trophies to Dick Day, quarterback for the North Augusta High School, and Pfc Harold L. Campbell, 206th Signal Company, member of the Fort Gordon Team, 5 December, at the Football Banquet held at Fort Gordon NCO Mess.

BERLIN CHAPTER—Charter presented on 4 February by the Hon. Bernard Gufler, American Minister, U. S. Mission, Berlin.

CENTRAL OHIO CHAPTER—Charter meeting at Columbus General Depot, 26 January. Maj. Gen. Ralph W. Zwicker presented the charter to Maj. Gen. L. M. Kreber, President. General Zwicker and General Kreber spoke on the aims of the Association and the responsibilities of members of the Chapter.

CENTRAL TEXAS-FORT HOOD CHAPTER—Annual meeting, 26 January, heard Mr. Samuel F. Downer, National Vice President, speak on the responsibilities of Chapter and Chapter members in a period of national stress. Dinner meeting was held at Fort Hood NCO Club. Chapter elected new officers; consensus was that the occasion was the Chapter's most successful meeting.

COLUMBUS-PHENIX CITY-FORT BENNING CHAPTER—Business meeting on 26 January elected officers, and presented awards to Past Presidents Reeves and Woodruff.

EAST BAY CHAPTER—Board of Directors meeting, 16 January, took up plans for implementing National requests, and planned future general meetings.

FORT LEONARD WOOD CHAPTER—Lt. Gen. William H. Arnold, Commanding General, Fifth U. S. Army, was the principal speaker at the Chapter's quarterly meeting, 12 December. General Arnold, speaking to an audience of more than 800 at Nutter Field House, emphasized the need for national strength and the importance of preparation for limited war. He made a plea for overcoming complacency and emphasizing leadership.

FRANKFURT CHAPTER—Meeting in Hanau, 12 January, elected two vice presidents and the secretary. Principal speaker was Lt. Gen. Clyde D. Eddleman; Maj. Gen. Alvin L. Gorby, USAREUR Surgeon, was

FORT HOOD, TEX. Mr. Samuel F. Downer, in topcoat, National Vice President, is briefed on 319th MI Battalion's language facility by Capt. Tsutomu Matsumoto *(right)*. Others are *(left to right)*, Maj. Gen. William S. Biddle, CG, III Corps; Col. Franklin G. Smith, CO, 2d Missile Command; Lt. Bernard F. Hurless, Jr.; and Maj. John H. Duchaj.

SEATTLE, WASH. Lt. Gen. Charles D. Palmer, CG, Sixth Army, speaker at January dinner meeting of Seattle Chapter, addresses the gathering. Almost obscured is Mr. Joseph Sweeney, Chapter President.

FORT GORDON, GA. Mr. L. C. Phillips *(right)*, Vice President of Augusta Area Chapter, presents award to PFC Harold L. Campbell, 206th Signal Company, voted Most Valuable Player of post's football squad. Officer in rear is unidentified.

BERLIN, GERMANY. Lt. Col. Frederic C. Thompson, President pro tem of Berlin Chapter, presents certificate naming him Honorary President to the Hon. Bernard Gufler, American minister, U. S. Mission, Berlin. Presentation was made at activation of Berlin Chapter on 30 January. This is the only AUSA unit operating behind the Iron Curtain.

honored guest. About 350 members attended the meeting. Chapter awarded AUSA membership to Division Honor Soldiers for October. November and December, and to the winner of the Gen. Maurice Rose Award.

New officers were installed at meeting 19 December. The business meeting was followed by a presentation of "Project Ammo" by Lt. Col. Leon Kasmacki, 39th Artillery Missile Battalion.

GENERAL JOHN J. PERSHING CHAPTER—Chapter is engaged in a project of gaining liaison with other patriotic, civic and professional organizations to enlist widespread support for AUSA objectives. Article in *Nebraska State Bar Journal*, by Pershing Chapter President Jack Anderson, discussed problems of limited war.

GEORGE WASHINGTON CHAPTER—More than 700 Chapter members and guests, including officers of the Air Force and Navy, attended a banquet commemorating the first anniversary of Explorer I, the nation's and the Army's first satellite, 31 January, at the Willard Hotel. The Honorable Wilber M. Brucker, Secretary of the Army, was toastmaster and principal speaker. Others speaking included Maj. Gen. John B. Medaris, Dr. Wernher von Braun, Dr. William H. Pickering, Dr. James A. Van Allen, and Dr. Maurice Dubin. Mr. Brucker presented plaques to representatives of seventeen corporations which had a part in the successful launching. This was the Chapter's most successful affair to date.

GREATER LOS ANGELES CHAPTER—Board of Directors meeting, 14 January, at the Hollywood Brown Derby heard Dr. William H. Pickering speak on the missile and space program, and the transfer of functions of the Jet Propulsion Laboratory from the Army. Board decided to protest the proposed reduction in the strength of the Army, and to offer its services for the Armed Forces Day luncheon. Lt. Gen. Charles D. Palmer, Commanding General, Sixth U. S. Army, made a short talk.

HEADQUARTERS SEVENTH U. S. ARMY CHAPTER—Col. Jesse D. Bell, Seventh Army Quartermaster, and MSgt Daniel J. Ryan reported to the Chapter membership, 6 January, on AUSA's 1958 Annual Meeting. Both speakers stressed the importance of AUSA as a force to educate, rather than to pressure, influential legislators and policymakers in the importance of understanding the Army. Sergeant Ryan said AUSA's mission "is not to act as an advisory organization to the Army Command in making decisions. The mission is to tell the Army's story to civilians in such a manner that the citizens will understand the Army. . . ."

HEIDELBERG CHAPTER—At an informal dinner meeting, 12 January, at the Patrick Henry Officers' and Civilians' Open Mess, Heidelberg, Col. Robert P. Malloy from the Department of the Army spoke on "A Report of the Middle East." No official business was transacted; attendance was 275.

HUB OF THE SOUTH CHAPTER—Maj. Gen. A. J. Drexel Biddle, National President of AUSA, presented the Chapter's charter at an over-capacity meeting the evening of 27 January. More than 500 civic, political and military leaders attended the meeting, which received widespread publicity in the local press. General Biddle's subject was: "Realistic Considerations in our Search for Peace." Speaking from his long experience as ambassador and soldier, the President stressed the necessity for alertness to the dangers confronting us. Lt. Gen. Clark L. Ruffner, Commanding General, Third U. S. Army, spoke on AUSA. The "Pentomic Army" film was shown; the Third U. S. Army Band played for the gathering.

KELLEY BARRACKS CHAPTER—The NCO Club was the scene of a dinner meeting, 15 October, addressed by Maj. Gen. Thomas L. Sherburne, USAREUR G3, on the subject of the Pentomic division organization. Col. J. E. Walsh was elected President, and MSgt Harvey L. Spencer was elected Second Vice President to fill vacancies caused by transfers.

MARNE CHAPTER—Business meeting, 7 January, confirmed revised bylaws and selected a nominating committee.

MID-PALATINATE CHAPTER—Charter issued 9 January 1959.

MONTEREY COUNTY CHAPTER—Chapter moved off with an all-out membership drive on 13 January.

NORTH CENTRAL ARIZONA CHAPTER—Chapter reserved a block of seats at Phoenix College Auditorium to hear an address by Gen.

Albert C. Wedemeyer, 10 January, and held a Chapter meeting immediately following. New officers were elected. Earlier, the Chapter officers and wives attended a dinner given by the Southern Arizona Chapter at Tucson.

PALM BEACH CHAPTER—Dinner meeting, 17 January, at the Palm Beach Air Force Officers Club viewed official film "Fire Brigade." Chapter was invited to attend ROA Military Ball on 21 February.

POCONO MOUNTAINS CHAPTER—Meeting on 21 January brought Chapter up to date on business matters and information to members about National AUSA requests and requirements; Maj. George Kahl made a presentation on the Pentomic Army.

SEATTLE CHAPTER—More than 250 members and guests attended a dinner meeting in January which was addressed by Lt. Gen. Charles D. Palmer, Commanding General, Sixth U. S. Army.

SOUTHERN COLORADO CHAPTER—Charter issued on 9 January 1959. Territory, based on Pueblo, includes a portion formerly assigned to Pikes Peak Chapter.

SOUTHSIDE VIRGINIA CHAPTER—Election of officers held at general meeting, 5 January. Name changed to above from Fort Lee Chapter. Executive committee meeting, 22 January, formalized committee system (with wide civilian representation), organized speakers' bureau. Chapter is expanding its area northward to Richmond QM Depot.

ST. LOUIS CHAPTER—Organization meeting in December prepared charter petition for presentation and elected provisional officers. Charter has been issued.

3d ARMORED DIVISION CHAPTER—At meeting held in Hanau on 9 January, the Chapter decided to present AUSA memberships to the winners of the Division competition for Soldier of the Month and NCO of the Month for the past three months. The Chapter presented a Certificate of Achievement to Battery B, 2d Howitzer Battalion, 3d Artillery, for 100 per cent membership in AUSA of all officers and all noncommissioned officers in grades E-5 through E-8. Lt. Gen. Clyde D. Eddleman, Commanding General, Seventh U. S. Army, was guest speaker.

24th VICTORY DIVISION CHAPTER—Name changed to above from 11th Airborne Division Chapter at meeting on 12 December and new officers elected.

TWIN CITIES CHAPTER—Chapter elected officers at meeting on 19 January.

WASHINGTON STATE CHAPTER NO. 1—More than 230 members and guests attended a meeting, social hour and buffet dinner on 18 January at Madigan Army Hospital. Maj. Joseph A. Cherry received a Certificate of Appreciation for his efforts in organizing the Chapter. Lt. Gen. Charles D. Palmer, Commanding General, Sixth U. S. Army, was principal speaker. Officers were elected, and a Certificate of Appreciation was awarded to Mr. Harry Minor for his outstanding performance as President of the Chapter. AUSA objectives were read to the membership, and announcement was made that committees to pursue these objectives would be appointed at an Executive Committee meeting on 30 January.

WOLTERS CHAPTER—Officers meeting, 12 December, appointed committees for the following year, including one to explore and investigate the feasibility of holding a regional meeting in Mineral Wells in April. A resolution concerning changes at National Annual Meetings was drafted and submitted to National headquarters.

YAKIMA VALLEY CHAPTER—Maj. Gen. Louis W. Truman, Commanding General of Fort Lewis, addressed dinner meeting on 13 January. At the request of Col. Donald L. Lewis, Commanding Officer of Camp Hanford, Yakima Valley Chapter is assisting in the formation of a chapter in the Camp Hanford area.

ROTC COMPANIES

DAKOTA COMPANY, North Dakota Agricultural College—A talk by Captain Hieta on Corps of Engineers construction in France was the principal item on the program for meeting on 14 January. Meeting finalized plans for a banquet to be held on 31 March.

ELECTION OF OFFICERS AND TRUSTEES

for term beginning June 1959

VOTING INFORMATION

1. **Procedure.** Published in December 1958 Issue of ARMY.
2. **Who may vote.** Each General, Service and Associate Member may submit one ballot only.
3. **Mailing.** Send to the Secretary, AUSA. Mark envelope or package "Ballot" in lower left corner. More than one ballot may be sent in one envelope or package but each ballot *must* be signed by the individual voter.
4. **Late voting.** Ballots *received* after 1 May will not be counted.
5. **Form of ballot.** The ballot on this page is the official ballot. Those desiring not to mutilate their copy of ARMY may use a facsimile, but it is required that if facsimile is used the address block be filled in with complete information appearing on the address label or envelope including code numbers.

THE CANDIDATES

Anthony J. Drexel Biddle. For reelection. Former ambassador. Financier. Adjutant General, Commonwealth of Pennsylvania; Maj Gen NGUS. Harrisburg and Philadelphia, Pa.

Samuel F. Downer. For reelection. Vice President, Exchange National Bank, Colorado Springs, Colo. WWII service as Lt (jg) USNR. Accountant. Engaged in many civic, charitable and welfare organizations.

Edward H. Brooks. Executive Director, Association of Military Colleges and Schools. Lt Gen USA-Ret; commanded 11th, 2d Armored Divisions, V Corps, VI Corps (all WWII), U. S. Army Caribbean, and was G1, Department of the Army. Concord, N. H.

Paul L. Davies. Chairman of the Board, Food Machinery and Chemical Corp., San Jose, Calif. Army, WWII. Chairman of Dept. of Army Reorganization Committee, 1953-54.

Karl R. Bendetsen. Lawyer, corporation consultant. Vice President, Champion Paper and Fibre Co. Col, USAR, Assistant Sec/Army 1950-52; Under Sec/Army 1952. Hamilton, Ohio.

BALLOT

For President:

Anthony J. Drexel Biddle ☐

For Vice President:

Samuel F. Downer ☐

For Council of Trustees: (vote for three):

Edward H. Brooks ☐

Paul L. Davies ☐

Karl R. Bendetsen ☐

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Signature _____

Name Printed _____

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EDMUND R. WALKER COMPANY, University of Connecticut—At 15 January meeting, announcement was made that ten members of the Company would accept Regular Army commissions upon graduation in June. The Company is conducting a physical training program for MS III and IV cadets who have not attended Summer Camp. MSgt R. W. Hunt, instructor in Military Science, spoke on Burgoyne's Hudson Valley Campaign.

FARRIS-WARE COMPANY, Prairie View A&M College—Company opened 22 January meeting with a social hour, followed by I&E film on major Bowl games of 1958. Cadet Lt. Col. Clemon Daniels showed a film of the 1953 Orange Blossom game in Miami, in which Prairie View participated. New members were welcomed into the Company.

IDAHO STATE COLLEGE COMPANY—Lt. Col. John G. Dunlop, Commanding Officer of the Pocatello Area Command and Senior Army Adviser for Southeastern Idaho, addressed the Company 13 January on Reserve service and obligations, followed by a question-and-answer period. The company will assist in placing an Army display, to be manned by the Company, as a feature of the Military Ball. Announcement was made that the Company will assist the Military Department during registration for the second semester.

JOHN CARROLL UNIVERSITY COMPANY—Business meeting on 9 January viewed slides of Japan with commentary by Captain Helker of the MS Department, and decided that MS III cadets would handle the speaking engagement at Notre Dame, in order to gain experience. The Company features a speaker's bureau which gives five-minute talks on ROTC and military subjects.

MAD ANTHONY WAYNE COMPANY, University of Toledo—Capt. Phillip Zeller, USAR, addressed meeting of 14 December on the Army Reserve program.

RAM COMPANY, Fordham University—Meeting on 21 November discussed material received from National AUSA concerning Annual Meeting, and laid out future programs. Two films on Airborne Training featured meeting for 9 January.

ROBERT E. SYLVEST COMPANY, Northwestern State College of Louisiana—Company has decided to hold two meetings each month, rather than one as formerly.

SIOUX COMPANY, University of North Dakota—Dr. Vondracek, of the University faculty, spoke on the military history of the Middle East at 13 January meeting, held at the Grand Forks VFW Club. Plans were made for a military ball.

SOONER COMPANY, University of Oklahoma—A film on escape and evasion followed Company meeting on 15 January.

TEXAS TECH COMPANY—A Marine Corps officer, Captain Tomkin, stationed with the Marine Corps Reserve at Lubbock, spoke to the Company on 18 December on Army-Marine cooperation in Korea, and conducted a question-and-answer period following his talk.

GERMANY. MSgt. Daniel J. Ryan *(left)* shows MSgt. James E. Pound where to sign up for membership. Looking on are *(left to right)* MSgt. Richard L. Roy, SP5 Thomas D. Flaherty, and SFC George T. Borgeson. At this meeting Sergeant Ryan and Col. Jesse D. Bell reviewed events at AUSA's Fourth Annual Meeting.

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1. An Active Army of one million officers and men.
2. An Army National Guard of 400,000 officers and men.
3. An Army Reserve of 300,000 officers and men.
4. An increase in the rate of modernization of the Army so as to insure qualitative superiority in weapons and equipment.
5. Top priority in equipping the U. S. Army with sufficient transport aircraft to lift one-half of the strategic Army Corps.
6. Full use of the Army's proved capabilities in land-based surface-to-air defense systems.
7. Removal of weight and range limitations on Army aircraft.
8. Action to maintain and increase Career Incentives.
9. Encourage outstanding youth to enter the United States Military Academy.